GENERAL LIBRARY
JUL 14 1919
UNIV. OF MICH.

California State Journal of Medicine

ISSUED MONTHLY: OWNED AND PUBLISHED BY THE

MEDICAL SOCIETY OF THE STATE OF CALIFORNIA

Vol. XVII, No. 7 JULY, 1919 $1.00 a Year

CONTENTS.

Editorials 211
Editorial Comment..... 213
Special Article..... 214
Original Articles..... 216
Review of Our Knowledge Concerning the Etiology of Influenza. By Karl F. Meyer. 216
A Report of Influenza or Pneumonia. By Harold P. Hill, M. D., and G. E. Ebright, M. D..... 224
A Consideration of the Methods used in the Control of Inuuenza. By W. H. Kellogg, M. D..... 228
Some Clinical Features of the Present Pandemic of Influenza as Compared with the Pandemic of Thirty Years Ago. By H. Lisser, M. D... 231
The Treatment of Post-Influenzal Pneumonia in an Army Hospital. By W. W. Roblee, M. D..... 236
Pulmonary Conditions Wrongly Diagnosed as Tuberculosis. By W. C. Voorsanger, M. D..... 239

(Contents continued on page IX.)

ENTERED AT SAN FRANCISCO, CAL. AS SECOND-CLASS MATTER

Which Volume Have You?

Do you know there are *two* separate and distinct volumes of

Cabot's Differential Diagnosis

Each volume describes symptoms and diagnoses diseases *not* discussed in the other volume (see contents below). Which volume have you? If you have *neither*, then you are certainly missing one of the really helpful diagnoses on the market (*47,000 volumes* have been sold)—an analytical diagnosis based on a study of *180,000 cases* personally examined by Dr. Richard C. Cabot at the Massachusetts General Hospital.

VOLUME I. Symptom-Groups Considered: Headache, general abdominal pain, epigastric pain, right hypochondriac pain, left hypochondriac pain, right iliac pain, left iliac pain, axillary pain, pain in arms, pain in legs and feet, fevers, chills, coma, convulsions, weakness, cough, vomiting, hematuria, dyspnea, jaundice, and nervousness—385 cases and 22 symptom-groups.

VOLUME II. Symptom-Groups Considered: Abdominal and other tumors, vertigo, diarrhea, dyspnea, hematemesis, enlarged glands, blood in stools, swelling of face, hemoptysis, edema of legs, frequent micturition and polyuria, fainting, hoarseness, pallor, swelling of arms, delirium, palpitation and arhythmia, tremor, ascites and abdominal enlargement—317 cases and 19 symptom-groups. Per volume: Cloth, $6.00 net.

W. B. SAUNDERS COMPANY Philadelphia and London

FRANK F. WEDEKIND--- TRUSSES, ELASTIC GOODS ABDOMINAL SUPPORTERS

(SEE PAGE XI)

Dr. King's Sanatorium

FOR TUBERCULOSIS

BANNING CALIFORNIA

DR. J. C. KING'S SANATORIUM

Many years of successful results.
Altitude: 2500 feet. Dry climate.
Trained nurses. Excellent food.
Send for Circular.

ALLAN L. BRAMKAMP, A. B., M. D. JOHN C. KING, M. D.

A Reasonable Conclusion

Test It!

Bulgarian Bacilli Will Outgrow
Fermentative and Putrefactive Bacteria
And
Bring about all the benefits that can follow this changed condition of the intestinal flora.

BULGARA TABLETS, H. W. & D.

Present the Active Viable Organisms
in Convenient Marketable Form.
Note expiring date and see that the tablets have been refrigerated.

Literature and Material for Investigation Upon Request

HYNSON, WESTCOTT & DUNNING
Baltimore

California State Journal of Medicine

OWNED AND PUBLISHED MONTHLY BY THE MEDICAL SOCIETY OF THE STATE OF CALIFORNIA
BUTLER BUILDING, 135 STOCKTON STREET, SAN FRANCISCO

Secretary - - - - - - - - - - - SAXTON POPE, M. D.
Editor - - - - - - - - - - - - ALFRED C. REED, M. D.
Managing Editor - - - - - - - - - CELESTINE J. SULLIVAN

COUNTY ASSOCIATE EDITORS:

Alameda.....Dr. Pauline S. Nusbaumer, Oakland
Butte.....Dr. Edward Baumeister, Chico
Contra Costa.....Dr. P. C. Campbell, Richmond
Fresno.....Dr. C. O. Mitchell
Glenn.....Dr. W. H. Walker, Willows
Humboldt.....Dr. L. P. Dorais, Eureka
Imperial .....
Kern.....Dr. C. A. Morris, Bakersfield
Lassen-Plumas .....
Los Angeles.....Dr. Wm. Wenzlick, Los Angeles
Marin.....Dr. W. F. Jones, San Rafael
Mendocino.....Dr. O. H. Beckman, Fort Bragg
Merced .....
Monterey.....Dr. T. C. Edwards, Salinas
Napa.....Dr. Robt. Crees, Napa
Orange.....Dr. H. A. Johnston, Anaheim
Placer .....
Riverside.....Dr. Paul E. Simonds, Riverside
Sacramento.....Dr. Wm. A. Beattie, Sacramento
San Benito.....
San Bernardino.....Dr. C. L. Curtiss, Redlands
San Diego.....Dr. Robt. Pollock, San Diego
San Francisco.....Dr. Le Roy Briggs, San Francisco
San Joaquin.....Dr. Dewey R. Powell, Stockton
San Luis Obispo..Dr. Paul K. Jackson, San Luis Obispo
San Mateo.....Dr. A. L. Offield, Burlingame
Santa Barbara...Dr. Robert W. Hartwell, Santa Barbara
Santa Clara.....Dr. Chas. Richards, San Jose
Santa Cruz.....Dr. A. F. Cowden, Santa Cruz
Shasta.....Dr. F. Stabel, Redding
Siskiyou.....Dr. Wm. F. Shaw, Yreka
Solano.....Dr. A. V. Doran, Vallejo
Sonoma.....Dr. Elizabeth M. Yates, Santa Rosa
Stanislaus.....Dr. E. F. Reamer, Modesto
Tehama .....
Tulare.....Dr. J. T. Melvin, Porterville
Tuolumne .....
Ventura.....Dr. C. A. Jenson, Ventura
Yolo.....Dr. Frances L. Newton, Woodland
Yuba-Sutter .....

Contributors, subscribers and readers will find important information on the sixteenth advertising page following the reading matter.

VOL. XVII JULY, 1919 No. 7

SOUTHERN CALIFORNIA MEDICAL SOCIETY.

The sixtieth regular semi-annual meeting of the Southern California Medical Society, held in the Mission Inn at Riverside, May 14 and 15, was a banner meeting in attendance. The following program was successfully carried out and held the interest of the delegates until the last paper was read and discussed:

Wednesday, 2:00 P. M.

Neurological Complications and Sequelae in Epidemic Influenza.
Dr. Ross Moore, Los Angeles.

Pyelitis.
Dr. H. M. Voorhees, Los Angeles.

Further Observations on the Treatment of Deep Abdominal Lesions with the Roentgen Ray; Special Reference to Fibroid Tumors of the Uterus.
Dr. William B. Bowman, Los Angeles.

Wednesday, 8:00 P. M.

Etiology and Treatment of Uterine Prolapse.
Dr. J. Craig Neel, San Francisco.

Some Observations on Scurvy, Rickets and Syphilis in Children.
Dr. Hugh K. Berkley, Los Angeles.

The Treatment of Wounds, General and Facial, as Developed in France.
Lt.-Col. A. T. Bazin, D. S. O. C. A. M. C., Montreal, Quebec.

Thursday, 10:00 A. M.

Congenital Anomalies of the Ear.
Dr. Geo. B. Worthington, San Diego.

Focal Infection in Relation to the Eye.
Dr. C. E. Ide, San Diego.

Surgery of the Nasal Septum vs. Surgery of the Turbinates.
Dr. F. A. Burton, San Diego.

Double Empyema with Report of a Case.
Dr. C. Van Zwalenburg, Riverside.

In addition to the scientific discussions, Thursday afternoon, May 15, was devoted to a general discussion of the plans, purposes, policies and performances of the League for the Conservation of Public Health.

Papers were read by Dr. John H. Graves, Dr. C. D. McGettigan, Dr. Dudley A. Smith, Dr. James Franklin Smith, et al., and the League was heartily endorsed in addresses by Drs. W. T. McArthur, Walter V. Brem, Geo. H. Kress, E. E. Kelly, Harlan Shoemaker and John C. Yates.

Dr. Walter V. Brem won ringing applause of all the delegates when he stated: "The League for the Conservation of Public Health does not represent any particular section, group, department or clique of the ethical medical profession of California, but all sections, groups and departments in particular. It has no interests but the interests of the medical profession as a whole. We have been supine, afflicted by a great inertia and idly watched incompetents profiteer on the health of the public." Dr. Brem gave comparative statistics showing that the raids upon the Medical Practice Act were only the logical result of unopposed attacks of small bands that would prove fruitless against an organized and unified profession. "They call us the Medical Trust," said Dr. Brem, "and we should not shrink from the name or be untrue to the trust. Properly interpreted, it means that the people do

trust our profession. The greatest trust that one man reposes in another is when a patient places his life in the hands of his doctor. The life of the patients cannot be surrounded with too many safeguards, and we are unworthy of the trust which the people place in us if we do not build up our Medical Practice Act so that incompetents will be wholly eliminated."

Following the Riverside meeting the officers of the League from Northern California were given a luncheon in the Blue Room of the Los Angeles Athletic Club on May 16. Dr. Geo. H. Kress acted as toastmaster and with felicitous phrasing presented Drs. H. A. L. Ryfkogel, John H. Graves, W. T. McArthur, Granville MacGowan, W. W. Beckett, J. F. Cook and Mr. Celestine J. Sullivan. The spirit of the occasion was well expressed by Dr. McArthur, who assured the League visitors that the south, which had been solid against medical standards at Sacramento, was now solid for the League and never again would tolerate a solid delegation to misrepresent it. Dr. MacGowan referred to the League as a link between Capital and Labor, and the health work in which it was engaged as the best asset of both. Dr. Beckett emphasized the duty of all to support the League, as the constructive work it is doing is for the common good.

HOSPITAL EFFICIENCY.

What was the matter with the patient? Did they find it out beforehand? Did the patient get entirely well? If not, why not? Was it the fault of the doctor, the disease, or the patient? Can such failures be prevented in the future? Dr. E. A. Codman asked these questions in 1915. They are equally pertinent now. Try applying them to your own hospital, be it small or large. Try them on your own patients, too, whether in hospital or office. Be honest for a time and appraise the actual service rendered by the hospital with which you are connected, as measured by the end-result in the patient.

Any such appraisal demands, as a prerequisite, accurate case records. Case records, to be accurate, must present the data from which the questions above may be answered. Then an analysis of the causes of failure can be prepared and definite remedies sought, if they are remediable. Codman rightly stated that the most difficult step is to get the hospital staff to admit and record imperfect results in diagnosis and treatment.

Blind confidence in the physician is archaic. To-day he must show results, as an individual practitioner, and as a profession, if he is to succeed or even survive. The seniority system of promotion is just as fatal to professional advancement in medicine as it has proved itself in the army and navy. It is inefficient, unjust, undemocratic, and cannot be abolished too soon in hospital staffs. Results in diagnosis and treatment should alone be the criteria for judging professional excellence. These alone should determine promotion in clinical staff appointments, so that a position on such a staff would become a legitimate advertisement that the incumbent was professionally proficient.

It is time to sweep out the debris of old systems which do not measure up to such a standard of hospital efficiency. It is time to remove the omnipotent dollar from its key position in many hospital organizations. If we believe these things, why not practice them? If there is any physician who disagrees with the points here made, these columns are open for his reply. The time has come in hospital organization as, for example, in the matter of fee-splitting, when we must practice what we preach, or quit. How does it strike *you?*

HEALTH LEAGUE OF NATIONS.

Probably no more important subsidiary proposition could be considered in the League of Nations than the establishment of an international agency devoted to the interests of public health. Without health all other international codes fail. Nothing so surely isolates a nation to-day as illness. Certainly health, in the broadest sense, is one of the most vital and statesmanlike departments which can be incorporated in the League of Nations.

Soper[3] calls emphatic attention to the present wide distribution of pestilence in Europe. Cholera, typhus and plague are more than threatening. In addition, disease dangers in the Near East are lowering with menace to the world. The problem of disease dissemination by the demobilizing armies is not being met because it is so vast. One example of this is the fact that men are being returned to civil life after going through heavy epidemics of symptomatic dysentery of undetermined causation. Parallel to this, McAdam and Keelan,[4] in an extensive investigation of amebiasis in troops in Mesopotamia, found that of 351 non-dysenteric patients in a general hospital, 13.6 per cent. had amebic cysts; of 595 men in a convalescent depot, 17.8 per cent. carried cysts. According to Dobell's "figure for correction," about 33⅓ per cent. of the troops serving in Mesopotamia are amebic cyst carriers. A review of the numerous diseases spread by human carriers, in the light of this suggestion as to dysenterics, shows the enormous importance of the health problems of demobilization.

Parenthetically, it is appropriate to remark that the precautions against syphilis, gonorrhea, and alcoholism, which were so advantageous in the period of mobilization, should not be relaxed, but should be scrupulously observed until every demobilized man has found a steady job. A further parenthetical observation is to the effect that those health precautions which proved so efficacious in the army and navy, instead of being relaxed, should be extended to the entire civil population.

Such are but a few of the problems which only an international body with adequate scientific authority can handle properly. As Soper observes, its functions should include not alone the prevention of epidemic disease, but also the prevention of less spectacular diseases. In Europe, the great problems include sanitation, tuberculosis, personal

[3] N. Y. Med. Jour., May 24, 1919.
[4] Ind. Jour. Med. Res., July, 1917.

cleanliness, educational propaganda, etc. These matters are pressing, they are international, and the world's best scientific skill should be available for each nation through the operation of such a health league. Its functions should be supervisory, advisory, co-ordinating and investigative. Its program should at first lie under three heads: (1) Survey of health conditions from international point of view, (2) Control of specific diseases of international importance, and (3) Standardization of health procedures.

Several boards and international organizations have appeared from time to time, seeking in some measure to meet this need. None have been effective or sufficiently authoritative. The International Sanitary Congress met in Paris in 1903 and drew up an agreement for the better management of plague, cholera and yellow fever. In 1907 this agreement was ratified, and there was established in Paris the Office International d'Hygiene Publique. Germany and Austria were never represented. This body is still functioning, but its scope and authority are limited.

The Red Cross is not suitable nor strong enough. Only a major department in the League of Nations can adequately meet the urgent need of to-day. Gradually people are learning that after all *health* is the great desideratum. On no other ground could international action be more disinterested and easier co-ordinated. No superior point of approach could be devised for working out a comity of nations. It might be that governments could best learn to agree and co-operate by an international health program first, which would iron out the difficulties of political and economic programs. Already the tentative draft of the League's constitution makes account of health matters as they affect industry. The suggestion seems timely that a major department of the League of Nations should embody an international health board.

LEAGUE ENDORSEMENT.

The members of the League for the Conservation of Public Health are deeply gratified over the many strong endorsements which their work is receiving. One worthy of special mention was unanimously given by the California State Homeopathic Society during its recent convention. The following resolution was introduced by Dr. C. B. Pinkham and unanimously carried:

WHEREAS, The League for the Conservation of Public Health has rendered and is rendering important service in promoting a wider and more accurate knowledge and adoption of preventive measures and is dedicated to the policy of putting the principles of preventive medicine and surgery into general practical effect; and

WHEREAS, A number of the members of the California State Homeopathic Medical Society are members of the League for the Conservation of Public Health; and

WHEREAS, Our Society is in active accord with the objects of the League; therefore be it

RESOLVED, That the California Homeopathic Medical Society in its 43rd annual session assembled in San Jose, May 14 to 17, 1919, sends greetings to the officers of the League for the Conservation of Public Health and assures them of our hearty approval and co-operation in promoting the objects of the League; and be it further

RESOLVED, That the California State Homeopathic Society sends assurance of its hearty support of all legislation in the furtherance of higher standards in medical education and the continuance of the rights of unlimited practice as now obtains.

FITTING FEET WITH FAULTLESS FOOTGEAR.

The Chinese woman with her bound foot excites the derision and pity of the self-complacent Occidental. The American woman with her ridiculous imitation of a horse's hoof excites the derision and contempt of the observant Oriental. Dame Fashion, however, brooks no criticism, so we are told, and neither reason nor health are concerned in her mandates. Yet the Dame must look to her own laurels or she will find herself outlawed by her quondam willing slaves; for the War Work Council of the Y. W. C. A. has started a campaign for fitting feet with faultless footgear.

As a result of examinations of various groups of girls in different occupations, made in an endeavor to promote health among women, the fact has been forcibly demonstrated that an overwhelming number of women are wearing shoes which, with narrow-pointed toes, inflexible shank, and in most cases high heels, pinch the foot, cause bad posture, and so incapacitate the wearer for freedom at work and necessary normal exercise, all of which affects the general physical condition.

A proper shoe for man or woman should embrace the following features: A low, broad heel, a snugly fitting heel, an inner edge straight from heel to great toe, room for spread in the metatarsal arch when weight is put on the foot, and a snug arch.

It is about time such shoes were made in popular quantities and prices, and when they are made, physicians should urge their universal wear. Why not get some modern ideas of beauty and health into Dame Fashion's superannuated cranium, and give American women an opportunity to cease imitating the Chinese woman and the horse of 4,000 years ago?

EDITORIAL COMMENT.

Health officers, physicians, and public authorities should be prepared for a probable recrudescence of epidemic influenza next fall.

You are undoubtedly interested in knowing how your Assemblyman and Senator responded to the roll call. Read "The Roll Call and Results" in this issue of the Journal.

"Good health and good sense are two of life's greatest blessings. Health is the vital principle of bliss, and exercise of health."

Strange, is it not, that newspapers which parade the prurient episodes of murder, divorce and abortion in heavy type on the first page, should modestly refuse to call syphilis and gonorrhea by name! Such hypocritical mock modesty is a tremendous handicap in public health education.

Sellards[1] describes a simple practical test for acidosis which can be employed in the home as well as in the hospital. In health five grams of sodium bicarbonate daily are sufficient to give an alkaline urine. When there is serious reduction of the alkaline reserve of the body, 100 grams daily may still leave the urine acid.

Perusal of the State Society papers leads to the pessimistic conclusion that the Journal's editorials are carefully shunned by authors. Wrong capitalization, incorrect spelling, narrow margins, single spacing, carbon copies, and still other and lesser sins are all too frequent. Also, and not least, why be verbose? See if it can be said in fewer words, or better left unsaid.

There is excellent reason, physiologically and biologically, for condemning the daylight saving act. Chickens and children are not concerned about clocks and refuse to regulate their doings by act of Congress. The childless city dweller may fancy he profits by an extra hour of twilight. The dew, however, does not dry any earlier in the field, nor does the sun reach the meridian beauty and glory of the day by the clock, but by the sun-dial. We are opposed to daylight saving in this postbellum era and believe that the average man would be healthier, wealthier and wiser would he regulate himself by the sun, instead of trying to accommodate the sun to his own slothful habits.

Dr. George E. Vincent, president of the Rockefeller Foundation, in a recent address[2] on the relation of the university to the public health, says: "The progress of public health in a democracy depends directly upon 'selling the idea' to the public. The experience of various state boards and voluntary societies in this country, the public health campaigns of the Red Cross and the International Health Board in France, have proved that vivid and picturesque publicity, verbal and visual, accomplishes valuable results. Shall work of this sort be left to independent advertising experts and popularizers, or shall universities recognize the art of applied mass-psychology, and consciously train men and women to organize and administer campaigns of popular education in preventive medicine?"

1 Principles of Acidosis.
2 Science, March 14, 1919.

Special Article

THE ROLL CALL AND RESULTS.

Have you analyzed the roll call since the Legislature adjourned? When the Assembly and Senate chambers are deserted, and the members have done their best or worst and departed, and the little brief authority in which they were dressed looks briefer and more diminutive, it is well to consider calmly and impersonally the "ayes" and "noes." Whether your representatives were representing or misrepresenting you at Sacramento is not a matter of conjecture but of record. The roll call tells the story.

The roll call of the forty-third session of the California Legislature shows that "Nature hath formed strange fellows in her time," and that some of them were members of that Legislature. Some of these "strange fellows" who voted to bestow the title of physician and surgeon upon many whose qualifications were unknown to them, and others, whose utter lack of qualificaitons was a matter of official record, are now claiming complacently that they voted under a strange misapprehension.

They now confess, what is ever obvious to thoughtful men and women, that the highly technical skill of modern medicine and surgery can only be acquired by years of special training. They admit that definite educational qualifications are essential and that the State has already established by fair examinations the proper method of determining who are qualified to practice medicine and surgery in this state. They acknowledge that to permit the uneducated, incompetent, inexperienced and unqualified to attempt to control communicable diseases, to prescribe narcotics, to administer medicine, to perform serious operations, etc., would not only endanger the life of every man, woman and child for whom they prescribed or upon whom they operated, but would be a positive menace to the public health. 'Tis strange, but true; for truth is always stranger than fiction, that some of these strange fellows believe as here set forth, and, nevertheless, voted for Assembly Bill No. 933, introduced by Frank W. Merriam of Long Beach. Why did they do it?

Reasons as plentiful as blackberries in June and varied as rainbow tints have been offered.

Some claim in extenuation for their mistake in voting for such a dangerous measure as Assembly Bill No. 933, that they were told and believed it merely permitted the osteopath to continue the same practice which he has enjoyed for the past twelve years. That many members of the Legislature were regaled with that romance seems credible, as Dr. W. W. Vanderburgh, osteopath, conversed with various members of the Legislature, but that they believed it seems incredible. They had the bill itself before them, and despite the inaccurate statements of Dr. Vanderburgh, made in the public press, that the bill merely permitted the osteopath to enjoy the same practice he has enjoyed for twelve years, the most cursory examination of the bill would have revealed its pernicious purpose.

W. W. Vanderburgh, osteopath, a former member of the Board of Medical Examiners, during the controversy over this bill, allowed his imagination to become overheated, and the result was a supercharge that the American Congress refused to commission or recognize osteopaths in the U. S. Medical Corps during the war, because Congress was influenced by the powerful lobby of the American Medical Association.

This would have been a serious charge if one were deluded and took this illusion of Dr. Vanderburgh seriously. Of course, the evil influence of this alleged powerful lobby upon Congress is not only fictitious but slanderous. That osteopaths, who would have been the beneficiaries of Assembly Bill No. 933, were not commissioned by the Government was possibly due to the fact that the Government was seeking the best for its men and could not afford to risk unnecessarily the health of any of its fighting units; and so it did well not to recognize or commission a single beneficiary of this bill.

It is only on the violent hypothesis that the Legislature has some magic power to infuse medical knowledge, impart scientific information and supply surgical skill, even where fair examinations have disclosed the aching absence of this essential knowledge, information and skill, that the action of those members of the Legislature who voted for Assembly Bill No. 933 can be logically explained. It is similar to the inconsiderate type of legislation proposed by reckless Jack Cade when he vowed reformation and promised that seven half-penny loaves should be sold for a penny, "the three-hooped pot shall have ten hoops," and that he would apparel them all in one livery. He didn't care a whoop whether the hoops or livery fit. A number of legislators, in fact a majority of one in both the Assembly and Senate, decided to apply "the hoop idea" of legislation to physicians and surgeons and "apparel them all in one livery." They decided to clothe the competents, the incompetents, the qualified and unqualified with equal power and uniform titles. Why did they do this?

The most convincing explanation was offered by a shrewd political observer long familiar with the course of legislative men and measures. He stated the case laconically. "Political power pursues the line of least resistance. The medical profession offered the least resistance. An inferior, insignificant active minority impresses a Legislature far more than a superior inactive, influential majority. A majority of the Legislature believed that the ethical physicians and surgeons were indifferent, inactive and inoffensive in political and legislative affairs. Pressed by an organized minority they yielded and wholesaled the titles of the majority."

The medical profession of California, however, was not dead but sleeping, not indifferent, but inactive.

It has been aroused by the League for the Conservation of Public Health, and has proven that it is not too cowed to fight. One of the quickest and most effective responses ever given by any body followed the memorable call of the League to come to Sacramento.

The League wrote to Governor Stephens, requesting a public hearing for the purpose of presenting arguments to the Governor against Assembly Bill No. 933. The hearing was granted. The League sent out a call to doctors throughout the state, and, within only thirty-six hours' notice, distinguished men and women of the medical profession came to the State Capitol from every section of California in such numbers that they filled the Senate chamber. The merits of the question were fully, frankly and forcefully presented by Mr. Celestine J. Sullivan, the executive secretary of the League, and the sound judgment of Governor Stephens was demonstrated by his pocket veto of the bill.

The preservation of definite medical standards is essential to safeguard the health of the people. The duty of the state to protect the life and health of its citizens is a fundamental principle of government. Governor Stephens, as Chief Executive of the state, was merely performing this duty when he refused to sanction a law that would remove necessary safeguards and seriously menace the health of the public. The action of the Governor on this particular bill was in the interests of the people and will receive the unqualified approval of all who believe that those who treat the sick and afflicted in this state shoud be properly qualified.

The ethical members of the medical profession would have shown culpable indifference to the public welfare and been unworthy of the trust reposed in them by the public if they had not heeded the call of the League on this vital subject. We wish to congratulate the League and felicitate ourselves on the happy result. There were other bills before the Legislature in which hidden dangers lurked. These dangers were uncovered by the League and the bills are now hidden on harmless shelves. It required intelligent, organized persistent activity to accomplish what has been achieved. Eternal vigilance is the price of medical freedom, the same way that it is the price of commercial, religious and political freedom. Anyone who believes in keeping the medical profession isolated—wholly aloof from any participation in civic affairs—is evidently not aware of what is transpiring in this state and elsewhere in reference to the practice of the healing art. No physician and surgeon can say that he is intelligently interested in advancing or improving the medical profession or in maintaining the ethical practice of medicine or in promoting or protecting the public health who does not take an active interest in selecting those who pass the laws and also those who administer the laws. The ethical medical profession has no favors to ask and no special privileges to request. The interests of our profession and the public are identical. To whatever we advocate or whatever we oppose we shall apply the best test and touchstone for all measures—the common good.

Reviewing the roll call of the forty-third session of the California Legislature and applying that test, we are able to divide the members of the Legislature into three groups. In the first group we have placed the names of those who

voted to uphold standards and consistently opposed measures tending to remove safeguards vital to public health.

In the second group we have placed the names of those who at times were favorable, indifferent at other times, sometimes against standards and temporarily inclined to waver.

In the third and last group we have placed those who voted to lower standards. We are reserving for other occasions many comments on each of the groups and on the individuals that compose them.

GROUP ONE. Assemblymen: Anderson, Bennett, Broughton, Bruck, Calahan, Collins, Gebhart, Godsil, Gray, Greene, Hawes, Hilton, Johnston, Kasch, Kenney, Lamb, Lewis, Lindley, Manning, Mathews, McColgan, McCray, Morris, Morrison, Odale, Parker, Polseley, Prendergast, Ream, Rose, Rosenshine, Saylor, Stevens, Strother, Vicini, Warren, Wright, J. M. Senators: Anderson, Benson, Breed, Burnett, Canepa, Carr, Frank M., Crowley, Flaherty, Ingram, Johnson, Jones, McDonald, Purkitt, Rigdon, Rush, Scott, Sharkey, Thompson, Nealon.

GROUP TWO. Assemblymen: Badaracco, Browne, M. B., Easton, Eksward, Goetting, Locke, Martin, McKeen, Miller, D. W., Wright, H. W. Senators: Harris, Otis, Slater.

GROUP THREE. Assemblymen: Allen, Ambrose, Argabrite, Baker, Bromley, Brooks, Brown, J. S., Carter, Cleary, Cummins, Doran, Dorris, Eden, Fleming, Graves, Hughes, Hurley, Kline, Knight, Lynch, Madison, Mathew, Merriam, Miller, H. A., Oakley, Pettit, Price, Roberts, Wendering, White, Wickham, Windrem. Senators: Boggs, Brown, Carr, Wm. J., Chamberlin, Dennett, Duncan, Evans, Gates, Hart, Inman, Irwin, Kehoe, King, Lyon, Rominger, Sample, Shearer, Yonkin.

Original Articles

A REVIEW OF OUR KNOWLEDGE CONCERNING THE ETIOLOGY OF INFLUENZA,*

With notes on the Bacterial Flora of Respiratory Cultures of Influenza Patients in San Francisco, and the Value of Prophylactic Vaccination with B. Influenzæ Vaccine.

By K. F. MEYER,

Assisted by L. E. McRoberts, J. E. Stickel, H. E. Brown, J. Wollenberg.

From the George Williams Hooper Foundation for Medical Research; the Clinical Laboratory and Social Service Department of the University of California Hospital; the University of California Medical School.

The request of your Committee, to introduce a symposium on Influenza by a consideration of the etiology of this disease was accepted, after some hesitancy, with the understanding that the speaker might be permitted to outline certain features, rather than to undertake a full discussion of the already extensive subject itself. Recent investigations of the nature of the microbian cause of influenza are sufficiently comprehensive to justify the expectation that one should be able to draw some final conclusions. This, however, is not the case. There still remain many mooted facts which are deprived of their value by conflicting views and hypotheses. If one has read the older literature concerning influenza, it will be found that the discussions which accompanied each epidemic were identical with those which one reads and hears today. There is one striking difference, however; today there is little opposition to the view that influenza is an infectious disease. Most persons now agree that it is a communicable disease transmitted largely by personal contact, even in spite of the failure of some experiments which have been unable to transmit it artificially from person to person. Irrespective of all the careful bacteriologic studies dealing with all the micro-organisms which have been stigmatized as possible etiologic factors, clinical and anatomical evidences have shown that influenza is a definite infection which lowers bodily resistance to a wide variety of bacteria. Furthermore, it is evident from the available clinical data that the so-called influenza bacillus alone does not cause the condition, but that there must be an unknown factor which is responsible for uncomplicated influenza. The bacteriologist and the experimental pathologist are therefore forced to consider and discuss the etiology of influenza from three different viewpoints:

A. The distribution and incidence of the various micro-organisms which have been isolated from respiratory cultures of typical influenza.

B. Immunity and the value of prophylactic immunization.

C. An analysis of the data which support or refute the belief that influenza is caused by an unknown virus. The clinical and bacteriologic similarity of influenza with diseases known to be due to ultramicroscopic or filterable viruses.

I. *The distribution and incidence of various micro-organisms isolated from respiratory cultures of typical influenza cases.*

The methods of sputum, throat and respiratory cultures evolved during the past few years have been applied for the first time to the etiologic investigations of pandemic influenza since the 1889-1892 outbreak. Available for critical analysis are the results of work conducted in the United States. With a few exceptions the data have been collected from a broad point of view by a uniform technic, and present exceedingly valuable facts; which in turn are comparable to the somewhat meager information gradually accumulating from other parts of the world.

The most striking feature of the bacteriologic findings is the large number of different bacteria found in the respiratory secretions of influenza patients; it is rare that one well defined species is found alone in pure culture and that one can designate it, according to the orthodox dicta of bacteriology, as the causative organism of the disease. In the recent literature, evidence is also presented that one and the same patient can show on successive days a change in the character of the microbian flora of the respiratory tract. Sahli (5) has seen a complete shift from a pure influenza

*Read before the Forty-eighth Annual Meeting of the of the Medical Society, State of California, Santa Barbara, April, 1919.

Article abridged for printing. Additional charts, references and discussion will appear in reprint.

THE BACTERIOLOGY OF RESPIRATORY CULTURES BEFORE AND DURING THE APPEARANCE OF PANDEMIC INFLUENZA IN SAN FRANCISCO

Microorganisms:	Pre-epidemic period Sputum and throat cultures 111 cases 77 adults 34 children	1st Wave of Pandemic Influenza Respiratory cultures 90 on 75 cases: Blood cultures:12 Sputum cultures 45; throat swabs, 45; urine, 4. Sputum cultures	Throat cultures	Blood	Urine	2nd Wave of Pandemic Influenza Sputum cultures: 41, of cases of influenza pneumonias.
				10 sterile	4 sterile	
B. influenzae.	A 2 = 2.58%	31 = 68.7%	15 = 33.3%	2 = 4.4%		13 = 31.7%
Pneumococcus Type I	A 15 = 19.38%; C 2 = 5.88%	3 = 6.6%	0 -			1 = 2.4%
" Type II	A 5 = 6.45%; C (1)atypical	2 = 4.4%	0 -			8 = 19.5%
" Type III	A 9 = 11.61%; C 1 = 2.94%	1 = 2.2%	1 = 2.2%			10 = 24.3%
" Type IV	A 19 = 25.51%; C 15 =52.92%	11 = 24.4%	8 = 17.7%			19 = 46.3%
Streptococcus hemolyticus α and β types.	A 5 = 6.45%; C 6 = 17.64%	11 = 24.4%	9 = 20%			20 = 48.7%
Streptococcus infrequens	----------					5 = 12.1%
" anginosus	----------					3 = 7.3%
" pyogenes	----------					6 = 14.6%
Not classified	----------					6 = 14.6%
Streptococcus nonhemolyticus	A 16 =20.64%; C 7 = 20.58%	30 = 66.6%	44 = 97.7%			10 = 24.3%
Streptococcus salivarius						6 = 14.6%
" mitis						1 = 2.4%
Not classified						3 = 7.3%
Staphylococcus aureus	A 2 = 2.58%; C 2 = 1.8%	27 = 60%	37 = 82.2%			9 = 21.9%
Micrococcus catarrhalis	----------	13 = 28.8%	12 = 26.6%			1 = 2.4%
Friedlander's bacillus	A 1 = 1.29%; C 1 = 0.90%	3 = 6.6%	2 = 4.4%			-------
B. aerogenes	A 3 = 3.87%; C 3 = 2.70%					
Diphtheroids						1 = 2.4%
NOTES:	A 77 with 24 deaths = 31.1%.	One lung culture Staphylococcus aureus pure.				
	C 34 with 6 deaths = 17.64%	One case mixed infection with Pneumococcus Type II and III				

culture to one of pure pneumococci. Blake (6) and others called attention to the frequent occurrence of such floral changes, which they feel justified in explaining on the recently recognized fact of superimposed or secondary infections.

By contrasting these observations, made in diverse places, one is naturally confronted with the problem of distinguishing the accidental from the omnipresent micro-organism and of recognizing the bacterium which appears to be responsible for influenza.

Our findings in respiratory cultures before and during the outbreaks of pandemic influenza in San Francisco are chosen to serve as a basis for such analysis. By using a uniform technic it was our intention to determine the frequecy of the various organisms found in respiratory diseases on the Pacific Coast. Our interest during the pre-epidemic period was centered mainly on the distribution and incidence of the various pneumococci, but was involuntarily supplemented by findings which gained in importance when we analyzed the bacteriologic data collected during the first and second waves of influenza.[1]

The incidence of the various organisms encountered and their relative distributions are summarized in Table I.

It will be noted that the B. influenza was found in 68.7 per cent of the sputums, and 33.3 per cent of the throat cultures during the first wave; and 31.1 per cent of the sputums were positive for this organism in the second wave of the epidemic. In no instance was this organism found pure in the secretions studied. Two blood cultures revealed, however, the B. influenzæ in a pure state. Next in frequency rank the non-hemolytic streptococci and the staphylococcus aureus, which were found practically in every culture made from influenza patients. The hemolytic streptococci, pneumococci and micrococcus catarrhalis were found in about one-quarter of the cases during the first wave; they gained in importance, however, in the second wave. Various other organisms were sometimes isolated, but on rare occasions only. Their influence on the course of the disease seemed to be of no significance.

In contrast to these data, the findings made in the pre-epidemic period are of some interest. Only sputums of typical cases of pneumonia were studied, however, at that time, and special culture media to isolate the B. influenzæ were not employed. Therefore, the low percentage of 2.58 per cent of B. influenzæ in these pneumonia cases in all probability does not represent the true index of distribution and incidence of B. influenzæ in the respiratory tract of the civilian population of San Francisco. Attention is directed, however, to the incidence of the various types of pneumococci in the pre-epidemic period and during the epidemic itself. About one-fifth of all cases of pneumonia were due to Type I pneumococci in the period preceding the epidemic. Only 2 per cent. to 6 per cent of the influenza patients showed pneumococci of this type; most of these organisms belonged to the group of pneumococci generally designated as Type IV.

On several occasions, not detailed in Table I, because only determinations for pneumococci had been carried out, mixed infections of two types of pneumococci were recorded. A change from one type of pneumococcus to another type later, in the course of the influenza infection, was also noted in a few instances. It may be of interest, perhaps, to know that the influenza cases with Type I infections, which were diagnosed early in the disease, responded promptly to serum treatment with Type I serum.

Undoubtedly the most important question to decide is, which single one of the long list of accused micro-organisms or which group or "symbiotic complex" of them is primarily responsible for pandemic influenza? For the sake of clearness it would seem advisable to consider each type or group of organism separately.

1. The duration of the first wave was considered to cover the period from October 1st, 1918, to November 30th, 1918; the second wave from December 1st, 1918, to February 20th, 1919.

(1) B. INFLUENZAE.

Since the discovery of the bacillus of influenza by Pfeiffer in 1892, towards the end of the 1889-1892 epidemic, there has been a considerable amount of discussion as to whether this bacillus is or is not the etiologic agent of acute influenza. The conclusions of Leichtenstern in 1912, that "the B. influenzæ has sunk in the last ten years to the position of a saprophyte, found in bronchiectasis and tuberculosis, and that it is only sporadically dangerous and then only as a mixed infection," have not been accepted by Luetscher (1) and Lord (22), who found the organism in about thirty per cent of pulmonary infections in the interepidemic periods. Their presence in enormous numbers to the practical exclusion of other organisms in certain cases in the sputum during life and in the lung tissue after death suggested to these and many other writers that they are important contributory or principal factors in causing pathologic changes in man. Their occasional presence as the sole apparent cause of meningitis and suppurative lesions in various parts of the body was still further suggestive of their pathogenic power at certain times at least. It is true, however, that since the pandemic of 1889 and 1890 many of the so-called influenza epidemics have been found to be due to pneumococcus or hemolytic streptococci.

The following facts can be presented in the evidence against Pfeiffer's bacillus being the cause of influenza:

(1) *The Contagiousness:* The exceedingly high contagious nature of pandemic influenza—which traverses countries with a rapidity without an equal in the annals of epidemiology—suggests a causative organism of extremely small size. Meteorologic conditions in many regions and communities were most unsuitable for a bacterial infection to gain a contagious character as noted in influenza. Our experiences with pneumonic plague (see the reports of Strong et al. (29)) substantiate this point completely. On the other hand, we are fully acquainted with diseases due to filterable or ultra-microscopic viruses which, on account of their minuteness and the dilutions in which they can be invasive, are very contagious, possibly "air borne"; they obey the physico-chemical laws governing the diffusion of gases and substances in solution in liquids. The acute exanthematic diseases caused by "volatile viruses" have been placed in this class of infections. Additional proof of the close relationship of these highly contagious diseases is furnished by the observations of Van Zwalenburg (30), Foster and Cookson (31), Loomis and Walsh (32), Bloomfield and Harrop (107), and our own, that influenza is probably most contagious during the incubation period.

(2) *The Clinical Picture:* The main features of uncomplicated cases of influenza are indicated by a constant set of symptoms, characterized by erythema and appearance of the mouth; fever of a definite duration and leucopenia (Sahli, Bloomfield and Harrop, 107). For our analysis the leucopenia only deserves consideration. It is generally stated that the B. influenzæ causes a leucocytosis in man as well as in experimental animals. Some unpublished observations with a filterable poison obtained from the B. influenzæ, according to the method described by Parker, demonstrated the fact that rabbits respond to this toxin by means of a marked leucopenia. In our experience, the rapidity and degree of disappearance of the leucocytes from the blood stream in these animals differ very little from the commonly occurring leucopenia when bacteria or other split products are inoculated intravenously. Therefore, the contention of many writers, that the presence of a leucopenia in uncomplicated pandemic influenza can serve as a strong proof against B. influenzæ, needs further experimental and clinical confirmation.

In the second part of this paper attention will be called to the analogy of certain clinical features of pandemic influenza with those of diseases of unknown etiology. Hypoleucocytosis is a constant symptom of the following virus diseases: Dengue fever, Pappataci fever, Hog-cholera (33), equine influenza (34). (See Footnote 2 and others.)

(3) *The Anatomical Changes:* The autopsy findings of uncomplicated cases of influenza resemble those of an acute hemorrhagic septicemia with marked pulmonary œdema and involvement of the lymphatics (the so-called status thymo-lymphaticus observed by many pathologists) which produces an extreme depression of the general resistance of the individual to the invasion of bacteria. Under these circumstances, micro-organisms that are present in the throat or are introduced from without, readily invade the tissues of the whole respiratory tract and give rise to pneumonia caused by the different types of pneumococcus, staphylococcus aureus, streptococcus hemolyticus, or the influena bacillus of Pfeiffer (MacCallum, 35, Symmers, 36, and others). These findings are so constant—and particularly the changes caused by vascular injury are so striking—that we could not avoid being reminded of the same picture which we had observed in animal diseases, like hog cholera and equine influenza, etc. The pulmonary œdema is particularly known in African horse-sickness and bovine East Coast fever (see Meyer, Kolle & Wassermann's Handbuch d. pathogenen Microorganismen, 1913, vii, 551 and 555). In several autopsies with such characteristic lesions, careful and extensive bacteriologic tests failed to demonstrate the influenza bacillus, but the common bacteria of the respiratory tract. As an explanation, we offer here the well-known

2. We note that in the discussion of the diplostreptococci, in the "Abstract on Influenza" (J. Am. Med. Assn., 1918, lxxi, 1579), equine influenza, "pink-eye", Pferdestaupe and Druse, stranges of English, are considered identical and the terms are used synonymously. This assumption is incorrect; both diseases are etiologically different and are discussed separately in every text-book on comparative pathology. Equine influenza has recently been transmitted from horse to horse by means of filtrates of infectious material (Bemelman, Cent. f. Bakt. 1913, lxviii, 828). Strangles, a disease causing a suppurative inflammation of the nasal mucous membrane with accompanying suppuration and necrosis of the regional submaxillaris lymph modes, is definitely proven to be solely caused by the streptococcus equi. This organism, the strangles streptococcus, according to the studies of Adersen (Centr. f. Bakt., 1915, lxxvi, 111) is a long-chained, biochemically well defined specific coccus, which has very little in common with the diplococcus of Rosenow. The "Abstracts" fail to state the author of this misleading confusion.

fact that diseases due to filterable viruses are prone to invasion by bacteria. The diplococcus equi, while found frequently in cases of equine influenza or the so-called hog-cholera bacillus demonstrated in almost every case of hog cholera, have no etiologic relationship to the disease, the cause in every instance being a filterable virus. The evidence presented in previous paragraphs suggests that a similar connection exists in pandemic influenza.

(4) *The absence of B. Influenzae in Typical Cases of the Disease:* According to recent reports, Pfeiffer's bacillus appears as an inhabitant of the nasopharynx in endemic or epidemic distribution. In our experience tpyical cases repeatedly studied by a searching technic failed to show the influenza bacillus.

(5) *The Occurrence of B. Influenzae in Other Infections Than Pandemic Influenza:* The studies of Lord (22), Davis (37), Cole and MacCallum (38) and others have shown the Pfeiffer's bacillus to be a frequent finding in the sections from the respiratory tract under such a variety of conditions as pulmonary tuberculosis (33 per cent), measles (from 19 to 78 per cent), scarlet fever (39 per cent), diphtheria (60 per cent), and varicella (100 per cent). In consumptives, suffering from influenza, Corper and Downing (17) found the Pfeiffer's bacillus in a very high percentage (62-100 per cent). The organism certainly cannot be regarded as of etiologic importance in these diseases, but may be of significance as a secondary invader.

(6) *Attempts to Reproduce Influenzae in Human Volunteers and in Monkeys by Means of the Pfeiffer's Bacillus Have Been Unsuccessful:* In this connection we recall the observations of Pfeiffer (39) and the recent careful studies of Goldberger and McCoy (40) and Da Cunha et al. (41).

(7) *Immunization with B. Influenzae Vaccines Do Not Protect Against Pandemic Influenza.* This statement is based on the observations of Barnes, McCoy, Murray, Teeter, and our own series of vaccinations. Robertson (79) is the only writer who claims protection by the use of sensitized B. influenzae vaccines.

(8) *Experimental Work Has Demonstrated, in a number of Instances, the Presence of a Virus in the Respiratory Secretions and the Blood of Influenza Patients:* A discussion of this phase of the influenza problem is reserved for separate paragraphs of this communication.

The following facts may be mentioned in favor of the views that the Influenza bacillus is the cause of influenza:

(1) *The Influenza Bacillus is More Frequently Isolated Than Any Other Organism:* This statement may be true for a large number of communities, but is certainly not supported by the observations in the Middle West and Baltimore mentioned repeatedly. Numerous other observations fail to support this contention, for example, Meunier (42) in France noted during the first epidemic wave in May a predominance of the Pfeiffer's bacillus; in August, during the second wave, he could not find this organism, its place being taken by pneumococci or streptococci.

(2) *A Toxin Rapidly Liberated in Culture Media by the B. Influenzae Produces in Rabbits Symptoms Similar to Those Noted in Influenza Patients:* The experiments of Julia T. Parker (43) are thus far the only published data on record. They are very suggestive and can be used in explanation of many of the clinical facts of the disease. They certainly deserve further inquiry.

(3) *The Strain of B. Influenzae Causing Pandemic Influenza Differs From the Strains Which Have Been Isolated in Other Diseases or From Control Cases of Influenza:* A few incomplete reports (Rapoport, 44, Spooner et al., 45, A. Williams, 46) do not furnish support for this conception, but positive conclusions must be deferred until more decisive evidence in one or the other direction is brought forward. We understand that Park and Wlliams (48) are conducting a serological study of the various strains of the influenza bacillus isolated from typical cases and from control cases.

(4) *Antibodies* (Agglutinins, complement fixing substances) *Have Been Demonstrated in Convalescents From Influenza Pneumonia:* Spooner, Scott, Heath (45), Rapoport (44), Fleming (49), and others found specific antibodies in the serum of about 50 per cent of convalescent influenza pneumonia patients. Natural agglutinins were not found, but in about 9.6 per cent control sera gave a positive complement fixation reaction. Thus far no reports are available in which the sera obtained from uncomplicated cases have been subject to serologic tests. Whatever the outcome of further tests may be, they will only support the fact that a large percentage of influenza patients have been invaded by the influenza bacillus and that this organism plays an important part in the complicating pneumonia of influenza; but they furnish no conclusive evidence of an etiologic role of the Pfeiffer's bacillus.

(5) *The Occasional Presence of the B. Influenzae in the Blood Stream:* Medalia (11), Fleming (49) and others report occasional findings of B. influenzae in intravitam blood cultures. The small. percentages (Medalia 5.8 per cent) of positive results are not in accord with the clinical picture of a septicemia, or in harmony with our conception of the disease.

In summarizing this discussion on the B. influenzae it can be stated that the evidence is against the hypothesis that this organism is the primary etiologic factor of pandemic influenza. However, its presence in the sputum during influenza epidemics seems to be of definite diagnostic value and may have some significance in complicated cases.

(2) *Pneumococci and Streptococci.*

This group of bacteria frequently and, in some localities, exclusively found in the secretions of influenza patients, needs little comment from the standpoint of etiologic importance. Innumerable

reports, published long before influenza made its appearance, give vivid testimony of the etiologic importance of pneumococci and hemolytic or non-hemolytic streptococci in respiratory diseases. In our experience some observations deserve a more detailed consideration, however.

It is the general belief that most pneumonias following influenza resulted from *autogenous infection* with pneumococci or streptococci normally living in the nasopharynx of buccal cavity of man. With Opie, Blake and others (10) we believe this conception to be incorrect. Bateriologic (Opie and Blake) as well as anatomic studies (MacCallum, 35) have shown that the secondary infection in influenza can be displaced by successive tertiary or quaternary infections. Systematic and repeated sputum cultures have shown that superimposed double pneumococcus or hemolytic streptococcus infections were common in the wards in which such cross infections were permitted to take place. Every patient and every person engaged in the care of cases with respiratory diseases should be regarded as a potential source of danger. Epidemiologic data show that influenza patients are more in danger from the streptococci and the pneumococci carried by their neighbors, or from contact infections with contaminated eating utensils, than from their own respiratory microbian flora. The evidence collected by Opie and collaborators to the effect that streptococcus or pneumococcus pneumonia following influenza may spread by contagion throughout an entire ward, deserves the attention of every physician and public health worker.

It is also evident from some French reports, that similar observations were made in Europe. In a summary: "Sur la prophylaxie de la grippe" (50), it is mentioned that influenza predisposes to secondary infections, which in themselves can become transmissible to a very high degree.

The endemic or epidemic occurrence of fixed types of pneumococci or certain hemolytic streptococci (see Ely, Lloyd, Hitchcock and Mickson (51) as inhabitants of the respiratory tract where they serve as potential causes of pneumonia, explains the frequent local distributions of such complications. Prevention and a rational therapy of these or typhoid protein (see Cowie and Beaven, 108), pneumonias by means of serums (see Medalia, 109) are only possible when repeated, and systematic sputum cultures are made on all complicated cases of influenza.

Another fruitful field for research is opened by the reports on the so-called "Diplococcus epidemicus" and all the allied non-hemolytic streptococci so frequently isolated from the secretions of influenza patients. Very little is known concerning these organisms, but we fully agree with Davis (15) in his conclusions that "there are as good reasons for saying that the diplostreptococcus is the cause of influenza, as for saying the Pfeiffer's bacillus is the cause."

(3) *Staphylococcus aureus.*

Early in the course of our bacteriologic studies of influenza secretions, we were impressed by the frequent occurrence of staphylococcus colonies; sometimes in pure cultures. The significance of these organisms was only apparent when Patrick (52) Chickering and Park (53) showed in their excellent report that this organism, which is commonly found in the nose and throat of healthy individuals, may give rise to a serious, nearly always fatal, complication of influenza. In 49.0 per cent of the three hundred and twelve (312) cases, cultured by these workers, the staphylococcus aureus was present either alone (92 cases) or in association with various other bacteria. Chickering and Park consider the staphylococcus aureus not as the primary etiologic agent, but conclude that "the depressions of the individuals' defensive mechanism by the primary epidemic infection was sufficient to enable these cocci, found in the mouth secretions of healthy persons, to subsequently produce widespread pulmonary lesions." In the future, staphylococcus aureus should, therefore, be added to the list of complicating factors of influenza and should be recognized as an important organism in influenzal pneumonia.

(4) *Micrococcus Catarrhalis and Meningococci*

Recent reports support the early English findings of micrococcus catarrhalis in influenza secretions, but they are unanimous in the conclusion that this organism has no etiologic significance in the disease.

The findings of meningococci in influenzal pneumonia deserve, however, a more detailed consideration. Fletscher (54) found in 36 autopsies, meningococci eleven times (six Type II. one Type I, and four not typed); Kraus (20) reports parameningococci, and Chickering and Park (53) noted on several plates colonies identical with those of the meningococcus. Only one strain grew in subculture and could be identified as a true meningococcus. The presence of these organisms in the lungs (see also Jacobitz; Ztschr, f. Hyg., 1907, 56) and the occurrence of meningococcus complications in influenza, opens up a new aspect to our knowledge of the activities of the meningococcus. These cocci certainly have no primary etiologic importance.

(5) *Friedländer's Bacillus Group:* According to Rucker and Wenner (55) and Nichols and Stimmel (56) the pneumobacilli have pathologic significance as secondary or terminal invaders. In some cases they may be responsible for complicating bronchopneumonias. The most important point, however, that these writers make is that in smears these organisms can readily be mistaken for influenza bacilli.

(6) *Spirochetes and Spirillae:* Numerous French writers (Maclaud, Ronchere and Lantenois, 57, Loygne, 58, and others emphasize the presence of non-pathogenic spirochaetes in influenza secretions.

(7) *Bipolar Organisms:* Ciauri (59), Pontano (60), Italian bacteriologists; Harris (61) in England; and Chickering and Park at Camp Jackson and Kotz in Easton, Pennsylvania, found in several cases organisms conforming culturally and

morphologically to bacilli of the hemorrhagic septicemia group. From the available data we may conclude that these organisms have no more significance in the etiology of influenza than the ubiquitous diplostreptococci.

In connection with this critical analysis of the bacteriological findings of influenzal respiratory secretions, it would seem to be appropriate to discuss also the question of immunity in influenza and the value of prophylactic artificial immunization with bacterial antigens prepared with the predominating organisms found in influenza.

B. *Immunity and Prophylactic Immunization:* That a relative immunity is produced in an uncomplicated case of influenza is indicated by the course of the disease. A critical drop in temperature suggests the mobilization of neutralizing antibodies (H. Sahli (5) and Minkine (62)). The periodical recurrence of pandemic influenza with the peculiar age predisposition may well be explained on the basis of a relative immunity. However, until we know more concerning the "complex virus" of influenza, it may be advisable to adhere strictly to some selected, convincing examples which have been reported from Europe.

Lemierre, Raymond (65) and other French army surgeons noted the following occurrence:

1st group of artillery had 3 cases of influenza in April; 114 in August.

2nd group of artillery had 20 cases of influenza in April; 54 in August.

3rd group of artillery had 100 cases of influenza in April; 3 in August.

A *natural* immunity against influenza in young people is generally estimated to be found in 12 per cent (Hamilton and Leonhard) to 25 per cent of the community.

Many mooted questions concerning the immunity in influenza can only be solved by a careful analysis of the available data.

And again, the general belief that influenza will attack patients repeatedly, can only be refuted irrevocably, when the clinicians begin to saparate annual grippe from pandemic influenza and when modern bacteriologic methods are applied to the study of such instances. A discussion of all these problems would be exceedingly profitable, but is not in the scope of the present analysis.

The explosive and gigantic outbreak, accompanied by an alarming mortality, impressed public health workers, physicians and bacteriologists so profoundly that they felt justified in resorting to a form of prophylactic immunization which would stop the threatening course of influenza. In the light of what we knew at that time and what has since been published, we can only state that prophylactic immunization was, and is, a great experiment. On the other hand, we felt that the intelligent use of pure B. influenzae vaccine might give us strong evidence in regard to the etiologic relationship of this bacillus to the present pandemic. As already indicated in previous paragraphs, it cannot be said that convincing evidence has been forthcoming in favor of the procedures so far employed.

Wittingham and Sims (71), 1918, used a vaccine containing in addition to the organisms already mentioned, the micrococcus catarrhalis and the meningococcus. Among 156 inoculated persons the incidence of influenza was 5 per cent and among 149 uninoculated it was 12 per cent.

In an account of the work of the Illinois Influenza Commission during the recent epidemic, C. St. Clair Drake, 1918, states that among the Illinois counties answering questionnaires concerning the results of the use of vaccines within their boundaries, twenty-nine counties believed that the vaccine had served to prevent the spread of infection.

In the light of this deduction it may seem unnecessary to add further negative results concerning the value of vaccination against influenza. Our observations are quite in accord with those of Barnes and McCoy, and lend considerable weight to the expressed opinion that the B. influenzæ cannot be considered the primary cause of influenza.

Our experiences with a polyvalent B. influenzæ vaccine were as follows:

Toward the end of October and beginning of November we prepared, at the urgent request of the Health Officer of San Francisco, Dr. Hassler, about 50,000 cubic centimeters of a polyvalent B. influenzæ vaccine. Ten strains of B. influenzæ isolated in San Francisco during the pandemic were incorporated in the vaccine. The method of preparation was similar to that published by Leary (87). Some lots of the vaccine were sterilized by the addition of tricresol instead of heat. The vaccine contained one billion organisms per cubic centimeter; when used it was never older than seven days. Fresh vaccine was employed because it was noted that the killed influenza bacilli autolyzed readily in saline solution. The studies of Huenekens (88) with pertussis vaccine indicate that only fresh vaccines afford the desired protection; by analogy we reasoned that for such a closely related organism as the B. influenzæ similar factors may be of importance. It is our impression that autolyzed influenza vaccines gave less severe local or general reaction, and this in part explains the very mild reactions noted with the Leary vaccine which was completely autolyzed when it reached San Francisco. Three injections of one-half, one and one billion organisms were given on alternate days, subcutaneously. Complete filing cards of 617 vaccinations were kept by the social service department of the University of California Hospital. By means of questionnaires and patient's histories, so far 334—or more than 50 per cent of the vaccinations—results could be made available for analysis.

The results are summarized in Table III.

It is quite evident from the available statistical data that the vaccination with pure influenza vaccine failed to confer protection against the primary infection. The group of nurses at the University of California Hospital represents a very carefully

controlled set of vaccinated people. Following the vaccination 21.5 per cent during the first wave, and 32.7 per cent during the second wave contracted influenza at a time when the effect of the vaccine on theoretical grounds was expected to have reached its maximum. During the same time-interval, the morbidity percentage of the nurses at the San Francisco Hospital was 33.8 per cent. The figures dealing with the civilian population also indicate that the vaccination failed to prevent influenza infections. The total morbidity for San Francisco during the first wave was 5.3 per cent; in our vaccinated it was 6.7 per cent. It appears to be unnecessary to emphasize the various points which suggest themselves; the statistical data in Table III present the proof that prophylactic vaccination with a polyvalent B. influenzæ vaccine of the Leary or Park type failed to confer protection against pandemic influenza.

This series of observations is, naturally, open to criticism, because the use of the vaccine began only after the pandemic had already started and it was impossible to procure a sufficient number of control cases which were exposed to the same degree. We therefore abstain at this time from a more detailed analysis and offer for record the above stated general conclusions.

Before closing this discussion on vaccines, we desire to call attention, however, to a series of observations which suggest that vaccination during the height of a pandemic is not without danger. Ten of 107 nurses vaccinated developed typical influenza after the first or second injection. At first we assumed that these ten nurses were injected during the incubation time. But after further consideration we were more inclined to suspect that the vaccine "provoked" a latent or mild attack of influenza. Sahli (5) mentions quite a number of such provocations and extends a noteworthy warning against the promiscuous use of vaccines during pandemic influenza. In our series of observations these "provoked" influenzal attacks were not always mild and in several instances were complicated by bronchopneumonias. Provoked influenza cases should not be mistaken, however, for vaccine reactions. About 2 per cent of our total number of vaccinated, irrespective of the type of vaccine used, reacted either after the first, second or third injection, with symptoms which only after careful hospital observation were recognized as vaccine reactions.

In accordance with the plan outlined in the introduction, we will now proceed to discuss the data which supports or refutes the belief that influenza is caused by an unknown virus.

C. *The Unknown Virus.* In previous paragraphs attention has been directed to the close similarity, clinical and anatomical, of pandemic influenzal infections to certain animal diseases which, according to our present knowledge, are caused by filterable viruses (see Lanfranchi, 89; Bemelman, 90). This remarkable analogy has attracted the attention of a number of influenza investigators. Some have apparently been successful in demonstrating such a virus, others failed, however, in many carefully planned attempts. The purpose of the following paragraphs is to summarize and analyze this experimental work.

Selter (91), who failed to find B. influenzæ in the sputums of 33 cases examined at Königsberg submitted himself and his woman assistant to an interesting experiment. Their throats were sprayed for one-half minute with the saline filtrate of throat swab and throat washings of five patients. Both of them developed a typical, though mild, attack of influenza. He accepts the view of Kruse that the influenza virus belongs to the group of invisible microbes or aphanozoa.

In October, 1918, Nicolle and Lebailly (92), at Tunis, concluded from their experiments that the bronchial secretions of influenza patients are virulent for human beings and for monkeys. The unfiltered and filtered material employed for inoculations came from a patient who had been ill for two days. The unfiltered substances were inoculated into monkeys (Chinese bonnet monkey) by the subconjunctival and nasal routes, and in each case caused the disease. The filtered material was used upon human volunteers to whom it was given subcutaneously and intravenously. Those inoculated subcutaneously contracted the disease; those intravenously did not. Blood taken from a monkey suffering from the disease and introduced subcutaneously in man did not produce the disease. From these experiments it is concluded that the cause of the disease is a filterable virus which does not inhabit the blood stream, but which does inhabit the respiratory tract. The incubation time in the successfully infected monkeys and volunteers was six days.

Gibson, Bowman and Connor (93) repeated and confirmed the observations of Nicolle and Lebailly. Two rhesus monkeys, inoculated subconjunctively and intranasally with the filtered sputum from cases of human influenza (5th and 3rd days of the disease) became ill on the sixth and seventh day, respectively. Two control monkeys, kept in the same room under the same condition, manifested no signs of illness during the same period. Of the two inoculated monkeys, one rapidly regained normal health, all symptoms appearing to have subsided by the third day of the attack. The other seemed to be extremely ill on the afternoon of the third day, when it was killed for further examination. The respiratory tract of this monkey showed the presence of a hemorrhagic exudate affecting especially the lower lobes of both legs. The condition found was, in many respects, comparable to that noted in certain human cases of influenza in which a fatal issue had supervened before the occurrence of marked secondary infection. Two rhesus monkeys, at first used as controls and subsequently inoculated, the one with filtered and the other with unfiltered sputum, collected from a case of influenza on the sixth day of the disease, showed no symptoms and remained well.

Da Cunha and his co-workers' [41] in Rio Janeiro inoculated monkeys with blood and sputum from influenza patients after filtration through a Berke-

feld or Chamberland F. candle. On two monkeys febrile reactions were recorded. Both monkeys failed to respond to subsequent inoculations with sputum filtrates. These experiments suggest the presence of a filterable virus in the respiratory secretions; evidence that the blood of influenza patients may harbor such a virus, is presented by a number of workers.

Dujarric de la Riviere [94] successfully transmitted to himself influenza by the subcutaneous inoculation of 4cc. of filtered blood derived from four severe influenza patients. The incubation was three days. The first inoculation conferred immunity, because a subsequent (10 days later) spraying of his nasopharynx and nasal mucosa with a filtrate of influenzal sputum failed to evoke any morbid manifestations.

Schofield and Cynn [95] conclude from a limited number of experiments on human beings, that the virus is present in the blood, but is probably not filterable. The possibility of a natural infection in these experiments is most probable and definite conclusions cannot be drawn from them.

Unfiltered blood from influenza patients induced—according to the observations of Blanc and Pignot [96], and Da Cunha and co-workers [41], a febrile reaction when injected into guinea pigs. The reaction being in many respects comparable with those seen in typhus fever or similar disease.

In using the so-called Noguchi's method for the isolation of the virus of Poliomyelitis, Foster [97] succeeded a few years ago in cultivating a filterable organism which is generally accepted as being responsible for common colds. Quite recently Bradford, Bashford and Wilson [98], and Gibson, Bowman and Connor [99] in England, used the same method and report the presence of a filter passing virus in the sputum, blood, pleural fluid, etc. of influenza patients.

According to these writers the virus isolated in cases of influenza consists of very minute rounded coccus-like bodies, vatying between 0.15 and 0.5 microa. It is gram positive and passes through various types of candles. It is an anaerobe, and resists heating to 56° C. for thirty minutes. It has been isolated by culture from the blood in six out of nine cases examined, from the sputum in six out of six examined, and from the cerebrospinal fluid in the only case examined. It has also been isolated from the lymphnodes postmortem in the only two cases examined. This organism can also be seen in stained films prepared from exudates, sputum, spinal fluid, etc. The culture (second generation) when inoculated into animals subdurally or intravenously, produces illness in guinea pigs and monkeys. Passage experiments done from such animals, when slightly ill, by injecting their blood, bile, etc., into healthy animals, causes in these more severe and even fatal illness, and postmortem the same lesions are found. The organism has been recovered by culture from tissues of such experimental animals.

All of these experiments need further confirmation which is naturally awaited with great interest.

The positive results in transmitting influenza to monkeys or to human volunteers have been repeated by several workers in the United States and in Italy. Some early experiments of Rosenau and Keegan [7], Nuzum, Pilot, Stangl and Bonar [14] and Micheli and Satta [100] were carried out on a small scale, frequently without the necessary controls, and ended in entirely negative results. The more recent investigations carried out by Gold- of the United States Public Health Service and the United States Navy on a very broad basis, deserve a more detailed analysis. For reasons as yet not entirely understood the experiments planned and executed to transmit influenza from patients to volunteers were not successful.

Inasmuch as we were permitted to participate actively in the experiments conducted by Doctors McCoy and Richey in San Francisco, we desire to recite briefly the most important points.

The volunteers chosen for the transmission experiments were sailors who had been quarantined and had not been exposed to influenza at the Yerba Buena Training Station. It was presumed that this personnel did not possess any special natural immunity. All of the men had also been vaccinated with large doses of a bacterial vaccine containing Pfeiffer's bacillus, the three fixed types of pneumococci and hemolytic streptococci. (For details see Minaker and Irvine, J. Am. Med. Assn., 1919, LXXII, 847). From the results analyzed in previous paragraphs, such vaccination had probably no influence in promoting resistance to influenza infection and may be ignored for the purpose of these transmission experiments. The following experiments were carried out: In one group there was instilled into the nostrils of each man a heavy suspension made by emulsifying cultures of eight recently isolated strains of Pfeiffer's bacillus without filtration. The other group had the same material used after passage through a Berkefeld N. candle. The results were negative, though the men were held under observation for seven days.

Emulsions from the upper respiratory passages of active cases of influenza from 15 to 48 hours from the onset were instilled into the nose by means of a medicine-dropper or with an atomizer. In each experiment, approximately an equal number of volunteers were treated with the same emulsion after filtration through a Berkefeld N. candle. In every case the results were negative, so far as the reproduction of influenza was concerned. The men were all observed for seven days after inoculation.

A filtered emulsion of material from the upper air passages of an acute case of influenza was dropped into the conjunctival sac of two volunteers and the same material injected subcutaneously into one volunteer. In each case the result was negative.

One cubic centimeter of blood taken during the active stage of influenza was inoculated subcutaneously into one volunteer, with negative results.

Judging from these important experiments, we feel only justified in concluding that influenza can be transmitted only with a very considerable degree of difficulty, and yet the facts noted during

the epidemic indicate that the reverse is true. It is natural to suspect that there are essential conditions, especially in the American series, which prevented transmission. To the workers acquainted with unknown or filterable viruses, these facts are not surprising, and many suggestions could be offered for further experiments. Only a few facts are selected, however; a detailed consideration is being reserved for another publication.

The San Francisco experiments can be criticized from the viewpoint that probably the volunteers were immune to influenza. Such an assumption is, perhaps, justified in the light of some epidemiologic observations made in various localities. The writer desires to add another suggestion which deserves further careful investigation. In 1890 Goldschmidt made, in Madeira, the carefully controlled observation that those people of the harbor town of Funchal who had been successfully vaccinated against smallpox remained free from influenza. So far we have not been able to investigate the personnel at Yerba Buena Training Station along the lines suggested by the observations of Goldschmidt, but we consider the data of sufficient importance to call them to the attention of all workers in influenza.

Next in importance for further inquiry are the following points: Which of the many secretions of an influenza patient harbors the virus in an undiluted state; at what period of the disease are the secretions most infective, during the incubation time or during the entire febrile course of the disease, or very early in the course of the disease; where are the portals of entry of the virus?

Hundreds of experiments will have to be conducted to enable us to solve these most important questions. In our experience with many filterable and unfilterable viruses, we gained the impression that these viruses are very elusive and that inexperienced workers have to accept failures, as a rule.

Inasmuch as animal diseases caused by viruses for reason of the readily available number of receptive hosts, are more carefully studied, some of the facts established beyond a doubt may be of interest in this connection.

Contagious pleuropneumonia of cattle, caused by a readily cultivated and filterable virus has never been reproduced in its proper anatomical picture by inhalation experiments (see Hutyra and Mareck, 102, and K. F. Meyer, 103). In Rinderpest the virus is apparently only found, with absolute regularity, in the blood and bile. The secretions from the eyes and mouth are infective in rare instances only. In certain exanthematic diseases, like sheep-pox, the virus is only found in the blood temporarily. The virus of foot and mouth disease can only be transmitted with difficulty by cutaneous or subcutaneous application to susceptible animals, but is always infective when intravenously injected or following subcutaneous introduction when blood vessels have been opened by the inoculation needle. Immediate intimate contact of the virus with the blood is an important factor for its transmission.

The virus of equine pleuropneumonia, according to Gaffky and Luhs [104], is present only at the beginning of the disease in the bronchial secretions, and is probably associated with certain cell inclusions in the mononuclear cells found therein. The rather short infective period of the supposed virus spender has resulted in many unsuccessful transmission experiments. Loss of virulence by uccessive passage of the virus (agalactia contagiosa) and lack of contagiousness in otherwise highly infective virus diseases have been reported repeatedly. For further detailed information the reader is referred to our summary on filterable viruses [103].

In conclusion, we only wish to express our hope that the influenza problem, as one of the most important subjects of modern etiologic research, will receive the attention of every physician, laboratory and public health worker.

A REPORT OF INFLUENZA PNEUMONIA.*

Occurring in the San Francisco Hospital under the San Francisco Board of Health—in the Services of the Leland Stanford Jr. Medical School and the University of California Medical School.

By HAROLD P. HILL, A. B., M. D., Clinical Professor of Medicine, Leland Stanford Jr. University, and GEORGE E. EBRIGHT, M. D., Assistant Professor Clinical Medicine, University of California,

Chiefs of Medical Staff and the Staff of the Hospital.

The influenza epidemic in San Francisco occurred in two principal waves—the first beginning October 5, 1918, reaching its apex October 25 and ending November 19. The second wave began November 24, reached its apex January 10, 1919 and ended February 5, 1919.

These two waves gave an opportunity of observing 3422 cases, the great majority of whom presented lung signs.

The following report is based on an analysis of 2000 unselected cases.

It can only be by a careful clinical description, unbiased observation of the effect of treatment, bacteriological reports and necropsies that we may in time form a definite clinical picture of this disease—and finally give us a more rational basis for its prevention and treatment. With this end in view and for a comparison with the description of the epidemic as it occurred elsewhere these cases are reported. It must be noted here that the epidemic burst on San Francisco, as elsewhere, and although with foresight Dr. Broderick, Superintendent of the San Francisco Hospital, acting under the direction of the San Francisco Board of Health, had removed all patients from the Hospital and prepared it for the receiving of Influenzal pneumonias—still the volume of work made complete and full records in all cases impossible. This was fairly well accomplished by attaching on the wall at the head of the bed in the wards, three record sheets:

On one was recorded graphically the tempera-

*Read before the Forty-eighth Annual Meeting of the Medical Society, State of California, Santa Barbara, April, 1919.

ture, pulse and respiration. The report of the urine and blood count was also written on this sheet.

The second recorded graphically the chest signs.

The third detailed the treatment.

This allowed of quick observation of conditions and treatment.

The average duration of the patients outside the hospital was 5.5 days.

The onset as recorded was sudden in over two-thirds of the cases. Eighty-five per cent. were between the ages of 18 and 45.

Cough, pain in the chest and throughout body, headache, weakness and chills were the common complaints.

The cough, which at first was frequently unproductive in many cases became blood tinged or distinctly bloody. Later there was commonly an amount of purulent expectoration.

The bloody expectoration varied—sticky sputum tinged with blood, thick viscid bloody sputum, rarely distinct hemorrhages, and in certain markedly cyanosed cases it was of a sero sanguinous character, which ran out of the mouth in quantities. Epistaxis was frequent.

The pain in the chest located beneath the sternum was of an annoying, raw, burning character, radiating through to the back between the shoulders—increased by the spasmodic, frequently in the beginning unproductive cough.

The temperature varied between 100-107. The highest recorded temperature was 107. The fall was by lysis in 85% of the cases—by crisis in 15%. The temperature was a better guide to beginning or increasing lung involvement than were the pulse and respirations.

The pulse at first was moderately accelerated, as a rule not in proportion to the temperature; of good quality and in the severe or fatal cases increasing in rate as the disease progressed, but rarely becoming irregular. It had a characteristic lack of sustained tension in certain cases—and this was always of serious moment. The cardiac dullness was rarely increased.

The respiratory rate was not over 32 in 44% of the cases.

The rate was not in proportion to the lung signs—but more directly in proportion to the toxemia—cases with few signs in the lungs might have a high respiratory rate, while cases with much involvement frequently showed under 32.

Lung signs were recorded in 84% of the cases —in 6% no record was made—10% were recorded without lung signs. In 58% both lungs were involved.

The lung signs were characterized by their varied multiplicity. The percussion note was less to be relied upon than the auscultatory signs. These last were predominantly posterior—at the base of either or both lungs or at the angle of the scapula. Frequently in the beginning these signs consisted of rales of a peculiarly characteristic quality—often only heard on forced deep inspiration—when they would burst in a shower of crackles close to the stethoscope in one of the regions mentioned. A case suspicious of lung involvement was always approached from the back.

The percussion note went through all its variations from impaired resonance to flatness—patchy areas of dullness alternating with areas of hyperresonance—dullness involving an entire lobe or more than one lobe. Frequently no definite change in the percussion note could be elicited. All variations in breath sounds and rales were found.

Cyanosis was a feature of the disease, marked cyanosis was a bad prognostic sign. Fulminating cases presented a picture of a peculiar deep cyanosis, at times almost black—of the face, hands and often the entire body.

The Leucocyte count in 514 recorded cases was above 8000 in 254 cases sometime during the course of the pneumonia and below in 260. A normal count or leucopenia was the rule in the beginning, as the pneumonia progressed the leucocytes increased. With a distinctly involved lung a decided leucopenia was a bad prognostic sign. Early high leucocyte counts were against an influenzal pneumonia.

The systolic blood pressure recorded in 275 cases was above 100 in 238, below in 37. The diastolic was uniformly low.

The urine showed albumen in 42% of recorded cases.

Fluid in the chest was present in 2.9%. A report of which is given in detail in the surgical section.

There were sixty pregnant women admitted with influenza in the service of Dr. Sperry.

Forty-two of these had pneumonia, and eighteen were simple uncomplicated influenzas. Of the forty-two with pneumonia nineteen died and twenty-three recovered. Of the simple influenza cases none died, the mortality in the pneumonia group was 45.6%. The mortality in the whole group was 31.2%.

Thirty-six (36) of the sixty cases or 60% went through the disease without any interruption of the pregnancy. Some of the patients died but with the foetus in Utero.

Of forty-two pneumonia cases, twenty-four were uninterrupted, or 57.5%. Of eighteen simple influenzas twelve cases were uninterrupted or 66.6%.

Eleven of the uninterrupted cases died, and thirteen recovered, the average duration of the pregnancy in these cases was six and one-half months.

Of the uninterrupted cases several are of special interest. One case went through a severe pneumonia and left the hospital well, carrying a full term live foetus.

One after a very severe pneumonia, was delivered during her convalescence of a full term eight-pound baby. An instrumental delivery was done in this case as soon as the cervix was dilated. Mother and child both did well.

One post-mortem Caesarean Section at eight and one-half months resulted in a live baby which lived for several weeks.

One mother who was admitted in a comatose condition, and who died next day, was delivered by accouchment force of a live healthy baby which lived.

Pregnancy in eighteen of the sixty cases was interrupted by the effect of the disease. Twelve of these cases were in the pneumonia group showing a percentage of 29.4% miscarriages or premature labors in pneumonia.

Six out of eighteen simple influenza were interrupted (33.3%) showing a larger percentage of interruptions in influenza than in pneumonia.

In the interrupted cases there were nine premature infants, six of whom lived, and were discharged from the hospital in good condition. One of these born at the eighth month weighed only two and a quarter pounds but left the hospital five weeks later in good condition weighing nearly four pounds.

There were only three cases admitted who had not passed the third month of pregnancy and there was no death in any case under the fourth month. Many of the cases came in moribund and died a few hours after admission.

The most interesting fact noted in the laboratory by Dr. Agnes Walker was the large percentage of positive Wassermanns obtained on cases of influenza at the height of the disease or early in the convalescence. Of 250 consecutive tests 16½% gave a three plus reaction with the acetone-insoluble-fraction antigen and modified Wassermann technique; 7% were two plus and 24% one plus, . . . the remaining 52½% being negative. In nearly every instance the weaker positives were found to be three plus by the Hecht-Weinberg-Gradwohl method. Of 200 routine hospital Wasserman tests performed just prior to the appearance of the epidemic 20% were one plus to three plus, and a similar number of routine examinations after the influenza epidemic had subsided, gave 12½% positives of varying degree. Thus the total number of positives of all degree obtained on influenza patients was 47.5%, a very marked increase over the 16% which appears to be about the normal average for the hospital at other times with the same reagents and technique.

As it has been impossible to obtain blood specimens from these patients since they left the hospital, no further tests have been made to ascertain their present condition, but it seems most improbable that over 47% of influenza patients were syphilitics, especially as in few instances were there definite histories or clinical signs of lues to substantiate such belief. There appear to be only two possible explanations of the phenomenon—either the victims of latent spyhilis are more susceptible to influenza than the non-syphilitics, or influenza causes a temporary non-specific or false Wassermann reaction—and of the two theories, the second seems the most probable.

Because of the hemorrhagic type of this disease it was suggested that the coagulation time be determined—this was found to be within normal limits in 100 cases.

The total number of patients admitted to the hospital was 3422.

Total number of deaths 977.

Percentage of mortality 28.6.

In twenty-four autopsies performed by Dr. Ophuls the findings in all cases were so similar that it was possible to summarize them in a general way as follows:

Practically all cases showed a very intense, general cyanosis which was associated with edema only in one instance. An acute inflammatory congestion of the conjunctivae was distinctly noticable in many instances and in some cases there was present an acute purulent conjunctivitis.

The mucous membranes of the upper respiratory tract including nose, naso-pharynx, pharynx, larynx, trachea and the larger bronchial tubes were intensely congested in all cases. The congestion was so intense in many cases that the mucous membranes exhibited a very dark red, almost black color. Microscopically there was a marked dilatation of the capillaries, some hemorrhages and at times, particularly in the bronchial tubes, a very marked infiltration of the mucous membranes with lymphocytic cells. The mucous membranes were covered with foamy, bloody fluid from the pulmonary edema in the more acute cases. In the later stages of the process, there was found considerable pus which, in the bronchial tubes, showed a marked tendency to coagulate, so much so that many of the small bronchi were frequently filled with plugs of coagulated mucus and fibrin, and in some instances false membranes had developed in some of the bronchial tubes.

There was an extensive consolidation of the lungs in all cases and the initial changes in the lungs were those of an exceedingly intense congestion and of a hemorrhagic edema which was later followed by a moist hemorrhagic consolidation which often involved large areas in the posterior portions of both lungs. This moist consolidation sometimes ended in a more definite hepatization of the tissue of a red or sometimes more grayish color; in other instances there developed definite areas of broncho-pneumonic consolidation about the infected smaller bronchial tubes. The consolidation in the lungs was followed by abscess formation in three instances and in one case there was in one of the lower lobes, a definitely more chronic form of pneumonia with fibrous thickening of the septa, which had terminated in gangrene.

The inflammatory process in the lungs was quite characteristic and different from what one sees in any ordinary cases of pneumonia. In many instances it was difficult to say whether the conditions should be described as a confluent bronchopneumonia or as a peculiar type of lobar pneumonia. I do not think, however, that the process was sufficiently similar to what we observe in ordinary cases of lobar pneumonia to be identified as such. That these differences were not due to

the varying nature of the secondary infectious agents was shown by the fact that in many instances, there were present in the same individual areas of acute hemorrhagic edema, irregular diffuse consolidations and typical broncho-pneumonic patches.

The pleura was involved in a great many instances, altogether 15 times in the 24 cases. In some of the cases the pleura was the seat of a dry hemorrhagic pleurisy but in the majority of them the exudate was purulent in character and eventually developed into a typical empyema. In three instances the pleural infection was associated with acute pericarditis.

The heart did not show any lesions in any case of this series.

The spleen was very little affected; it was slightly enlarged and soft in three cases.

The kidneys showed the effect of the disease very markedly in 17 out of the 24 cases. They were very much congested, swollen, the cortex very wide and opaque, and microscopical examination revealed very marked parenchymatous degeneration of the epithelium, which in some cases, had terminated in necrosis. In one of the kidneys there were many hyaline casts.

The liver was also swollen, congested and degenerated quite frequently. In five cases the microscope revealed definite central necroses. In this connection it may be mentioned that four of the twenty-four cases developed some jaundice which, in one case, was quite severe. These four cases were not the ones, however, that showed the most severe histological lesions in the liver.

There was also present quite frequently, a marked waxy degeneration of the muscles which, in some cases, was associated with considerable hemorrhage.

The brain and meninges were intensely congested in all cases in which the brain was examined; in one case there was found a very early stage of acute meningitis due to diplo-streptococci. Influenza bacilli were found in 16 out of the 24 cases, but in 10 of these cases they were present only in very small numbers. In five cases they were found in the bronchial tubes in considerable numbers and in two cases in the infected parts of the lungs. In the infected pleura they were found only twice and then in very small numbers. Otherwise there were present various types of streptococci of diplo-streptococci and pneumococci.

It was not possible to identify all these organisms culturally but enough was learned to make sure that these secondary invaders varied a great deal in different cases. We have had one case of staphylo-coccus infection with development of abscesses in both lungs.

It was quite interesting to observe in the smears in some cases that in spite of the presence of a very acute inflammatory reaction in the bronchial tubes and in certain parts of the lung tissue, there were present only very few organisms of any kind.

Our conception of the process, based on these findings, is that the initial lesions of the disease are due to the rapid invasion of the entire respiratory tract by some, as yet unknown, virus and that the influenza bacilli and the various forms of cocci merely perform the role of important, but distinctly secondary, invaders of the diseased tissue.

Treatment:

In the determination of the effect of any treatment one must take into consideration the protean character of the penumonias; an opportunity was had to judge of comparative results as each ward was in charge of a different attending physician. Although it was necessary to institute a general plan of procedure no objection was made to individual treatment in the different wards. An opportunity was thus had of judging the comparative merits of the different forms of treatments.

It was found that the charts and results of an enthusiast in some form of treatment were duplicated and paralleled by the charts and results in other wards with treatment of an entirely different character.

The following was the general plan of treatment:

Absolute rest in bed. Avoidance of chilling. Cold sponges were not used. Aspirin was given for relief of initial pains and headache. The cough was best controlled by heroin and codein. Mustard pastes to the chest gave great relief and were of benefit.

Fluid by mouth and sodii bicarb. 2% and glucose 2% were given rectally by Murphy drip method.

Salines and colon flushes were used to cleanse the bowels.

Cardiac and circulatory stimulants were used both early and late. Digitalis, strychnine, caffein, adrenalin, camphorated oil in large doses and strophantus.

Where there was evidence of much fluid in the bronchi atropine in large doses seemed to have an appreciable effect in lessening the fluid.

The following were used:

Leary vaccine in 68 cases—no appreciable effect.

Venesection—alone or followed by intravenous bicarbonate soda and glucose 2%—done on critically ill patients of the fulminating type. Temporary improvement, no permanent effect.

Leucocytic extract—no appreciable effect.

Convalescent serum—11 cases—not sufficient number to arrive at any conclusion. Discontinued on account of the number of positive Wassermanns.

In the treatment the toxemia was considered the most important factor. Results seemed directly dependent on the severity of the toxemia. That any form of treatment had a definite specific effect in influencing or aborting the disease was not determined.

That any form of cardiac stimulation applicable to all cases gave appreciably better results could not be determined. Death was not due primarily to cardiac failure.

The most important single measure was rest in bed. Early to bed and late to rise.

A CONSIDERATION OF THE METHODS USED IN THE CONTROL OF INFLUENZA.*

By W. H. KELLOGG, M. D., Secretary and Executive Officer, California State Board of Health.

Intelligent measures for the control of any communicable disease must of necessity depend upon a knowledge of the cause and mode of spread of that disease. We have learned much regarding influenza during the brief period that has elapsed since its appearance in pandemic form about September of last year, and the outstanding feature of our investigations and experiences with this disease are to the effect that we know virtually nothing at all about either its cause or its mode of spread.

The most generally accepted view regarding its mode of transmission is that it is droplet borne and in the absence of any definite knowledge to the contrary this is, of course, the most plausible theory. Its rapidity of spread in some instances is so great that it is difficult to reconcile it altogether with this view, but until more definite information is available it will be necessary to consider this probability in any control measures that we may institute.

Among the measures that have been very generally applied and which I will mention briefly before considering any one of them in detail are:

1. Reporting of cases.

2. Limitation of opportunities for contact and general association among persons, and this measure includes:

   (a). The isolation or quarantine of cases.

   (b). The closing of public gathering places, such as schools, churches, theatres, moving picture shows, public dances, etc.

   (c). The regulation of the hours for opening and closing of factories to prevent the crowding of street cars, the suppression of music in cafes;

   (d). The wearing of gauze face masks.

3. The institution of hospital, medical and nursing facilities and the various sociological activities made necessary for the care of the stricken by any disease affecting such a large percentage of the population.

4. Vaccines.

5. Education of the public in measures of personal hygiene and prophylaxis.

6. Enforcement of laws prohibiting expectoration in public places and laws requiring the sterilization of drinking utensils.

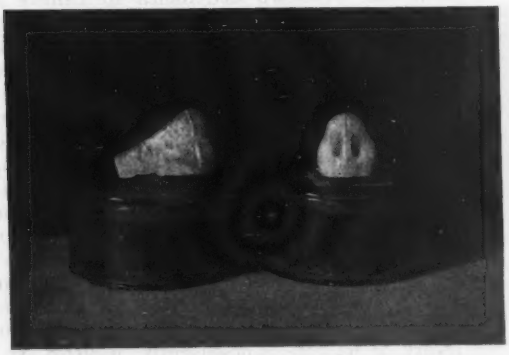
Having passed through our epidemic we are now in a position to reflect upon the various methods that have been used and to attempt an evaluation of the various control measures. For the purpose of arriving at an intelligent conclusion concerning any particular measure we must have intelligent and efficient means for gathering together the epidemiological data and arranging it in such a manner that conclusions can be drawn. In this work nothing gives us at once such a comprehensive view of the facts as does the graphic chart showing the rise and fall of the epidemic, both in cases and in deaths per hundred thousand population and correlated with the application of the measure in question.

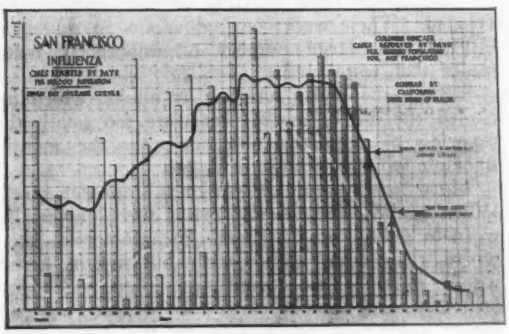
As an example of what conclusions may be drawn in this manner, we will take the matter of closing and see what deductions can be drawn from an inspection of Chart No. 1. This chart shows the mortality from influenza in terms of deaths per hundred thousand population by weeks in four cities, Boston, Washington, New York and Chicago. It will be noted in comparing the graphs of Boston and Washington that they are very similar. Boston being the first city to experience a serious epidemic from influenza during the present pandemic was taken unawares and did not develop any control measures such as the closing of public places, until the height of the epidemic was reached. Washington, on the other hand, with Boston's experience before it, closed everything tightly before it was known that a dozen cases were in that city. The chart shows that there is no difference between the two cities in the duration of the epidemic nor in the death rate. Furthermore New York city had a lower incidence of infection as shown by the number of deaths occurring and this city closed nothing at all, not even the moving picture shows. The city of Chicago, which has approximately the same curve as the city of New York, and is also lower than either Boston or Washington, may also be said to have instituted no closing measures worthy of mention. Moving picture shows were allowed to run with the display of caution signs against coughing and sneezing.

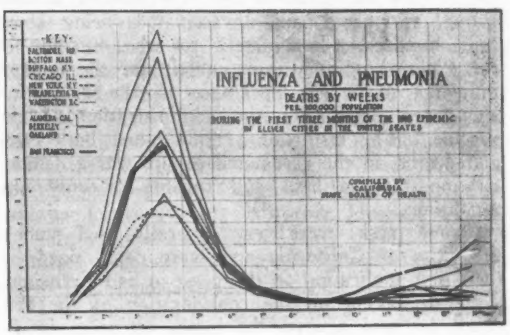
The value of graphic charts of this character is also shown in cut No. 2, which illustrates very strikingly the remarkable uniformity of the epidemic of influenza in the length of time over which it extends, which duration appears to follow some definite law which is not disturbed by any of the measures of control which have been applied. It will be observed that in every one of the eleven cities shown, the duration of time from the first sharp rise to the subsidence to approximately the base line is nine weeks.

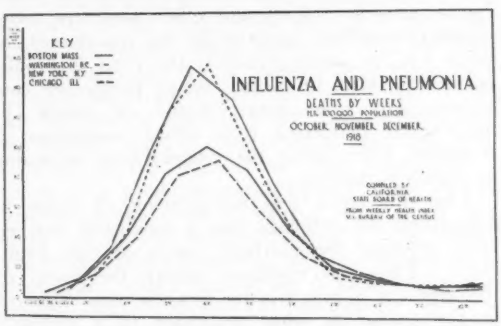
Mortality statistics give much more dependable information in influenza than do the morbidity figures for the reason that influenza is a disease that is not characterized by any certain methods of diagnosis and mild cases, which are most difficult of recognition, are very common. It is very evident that under these conditions the accuracy of reporting is bound to vary greatly with circumstances having to do with the state of the public mind, which includes that of the medical profession, regarding the prevalence of the disease in any given community. This influence is shown very definitely in all communities where a comparison is made by means of log curves showing cases and deaths. When the epidemic is on the increase, and the popular alarm and excitement is at fever heat, reporting is much more thorough and doubtless many cases not influenza are reported as such. On the other hand, when the epidemic is definitely known to be declining, many

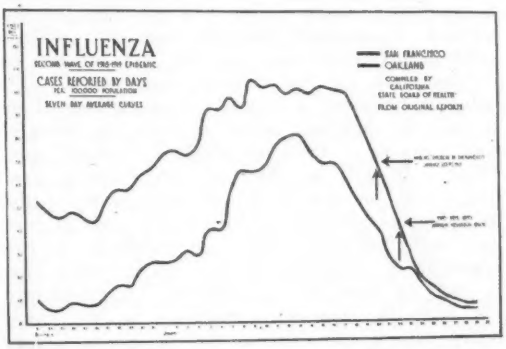
*Read before the Forty-eighth Annual Meeting of the Medical Society, State of California, Santa Barbara, April, 1919.

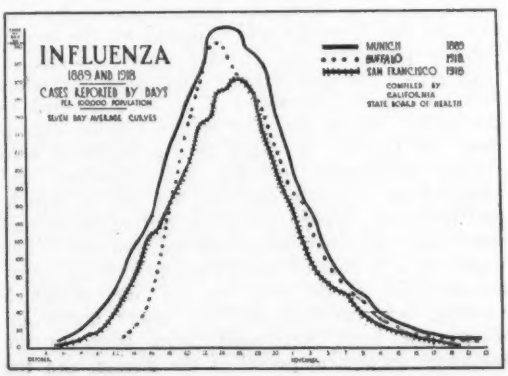












cases of true influenza are not reported or even considered as such for the very excellent reason that the majority of cases of this disease cannot be definitely and certainly diagnosed by any one, and the tendency under these circumstances of decline is to give the benefit of the doubt to a negative diagnosis.

The conclusion which I have reached regarding the value of measures of closing, based upon the mortality curves of the different cities, is that the measure is of no value in the larger cities, but is one that should be put into practice in smaller towns and rural communities, for the reason that in the latter places closing measures mean actual limitation of human association, for when the public meeting places are closed there is nothing

else for the people to do but remain at home, whereas, in the larger cities the closing of churches and theaters removes only a small part of the chance for association, and the crowding is increased in those places of congregation which cannot be closed, such as the sidewalks, department stores, lobbies of hotels, etc.

Vaccines have definitely proven to be of no value as a preventive measure by carefully controlled and carefully carried out experiments upon groups of persons known not to have been exposed previously to the infection. McCoy's experiment with the Rosenau type of vaccine in the Napa State Hospital, and with the straight influenza vaccine in a Massachusetts institution definitely disposes of vaccine as a preventive measure worthy of consideration. In the Napa experiment every other person in the institution under the age of forty years was given vaccine, the number in each group, vaccinated and unvaccinated, being about four hundred. Fortunately for the outcome of the experiment, and unfortunately for the inmates influenza made its appearance in the institution about ten days after the administration of the vaccine. The result of a trifle more, both cases and deaths, in the vaccinated group, was a demonstration that is final and capable of only one conclusion.

Gauze masks were very generally used among the cities of California and were popularized by their first application on this coast in San Francisco.

Before taking up the consideration of the evidence for and against the mask, attention is directed to Chart No. 3, for the purpose of explaining the seven-day average method of drawing a morbidity curve. An understanding of this method is necessary for the case rate will be used in presenting some of the facts of the use of the mask for the control of influenza. The columns represent a very common method of depicting the progress of an epidemic in terms of total cases or of cases per hundred thousand population. It will be observed that there is great irregularity in the height of these columns due to influences affecting the reporting, such as Sundays and holidays. There is ordinarily in case reporting a seven-day periodicity in error, due to lack of reporting on Sunday. Consequently, the seven-day average represented by the curve, which crosses the columns on the chart, is used as giving a picture that is much clearer, as well as being more accurate. The number of cases, as represented by the height of the curve on any one day is the average obtained by adding the reported cases for the preceding three days and the succeeding three days to the day in question and dividing the result by seven. This is done for every single day on the chart. Consequently, the case rate for each day has been made use of seven times in arriving at the rated figure for each of the seven days of the week.

That this method is accurate as well as more graphic, is proven by adding up for any given period the indicated case rates for all the days when it will be found that the sum is the same as the addition for the individual days as depicted by the column method.

When San Francisco determined to enforce a masking ordinance, the experiment was looked forward to with a great deal of interest and in the belief that the universal wearing of masks would exert a very powerful influence in the control of the disease, but also with the expectation that it would not prove feasible to enforce the universal wearing of masks. Contrary to expectation, the masks were worn cheerfully and universally, and also, contrary to expectation, of what should follow under such circumstances, no effect on the epidemic curve was to be seen. The reason for this failure, proof of which will be shown shortly, I felt inclined to explain by faults in its application rather than by any basic error in the theory of its use. Consequently, Bulletin No. 31 of the State Board of Health brought out the fact that where it was sought to control influenza by compulsory mask wearing certain obstacles developed. These were:

First, the large number of improperly made masks that were used.

Second, the faulty wearing of masks, which included the use of masks that were too small, the covering of only the nose, or only the mouth, smoking while wearing them, etc.

Third, the wearing of masks at improper times. When applied compulsorily masks were universally worn in public, on the streets, in automobiles, etc., where they were not needed, but where arrest would follow if not worn, and they were very generally laid aside when the wearer was no longer subject to observation by the police, such as in private offices and small gatherings of all kinds. This type of gathering with social intercourse between friends and office associates seems to afford excellent facilities for the transfer of the virus. If, as seems probable, the virus is droplet borne, this form of contact where people are conversing with one another would, of course, be much more dangerous than crowd association of strangers, even under the circumstances obtaining in public gatherings.

That the mask was not proving of value in controlling the influenza was a conclusion reached after studying the mortality curve of San Francisco. The final evidence against the value of the mask as a prophylactic measure was obtained in the course of what amounted to a perfectly controlled experiment on a large scale, which is graphically illustrated in Cut No. 4. This chart, which shows a seven-day average curve for the cities of San Francisco and Oakland for the second wave in December and January, presents a picture, from which the unmistakable conclusion is reached that no influence whatever is to be attributed to the mask. As in the case of the vaccine experiment of McCoy, we have here a perfectly controlled experiment in that San Francisco and Oakland are virtually one city, one part of which, San Francisco, applied the mask, during the second wave, and the other part, Oakland, did not. The upper curve is that of San Francisco and the upper arrows point to the place on the line, at which masking was enforced and the lower arrow indicates the point forty-eight hours later, or the minimum incubation period of the disease, and the

earliest possible date at which an influence could be expected on the rapidity of the fall. As a matter of interest, another chart is shown which gives a seven-day average curve in cases per day per hundred thousand population for the cities of Buffalo and San Francisco in 1918, and the city of Munich in 1889. The absolute similarity between the former and present pandemic in the duration and height of case curve is very striking.

Although feeling convinced that the gauze face mask was not a proper measure for compulsory application to the general public in the control of epidemics, it was felt that definite information concerning the results that could be expected from the proper wearing of a properly made mask were desirable. Two methods are available for an investigation of this kind, one being a controlled experiment, such as the one described in the application of masks by the cities of Oakland and San Francisco, but to be of value the susceptibility of the persons concerned, their exposure to infection and the quality and mode of wearing of the mask must be known. Such an experiment can only be carried out in a contagious disease hospital where absolute control of all these conditions can be maintained and it is to be hoped that in the near future this will be carried out by some one having the necessary facilities.

The other method is by laboratory experimentation and a series of tests have been carried out in the State Hygienic Laboratory, the technical work being performed by Miss Grace Macmillan. Previously reported experiments of this nature have taken no account of the influence of the forcible aspiration of air through the meshes of the gauze. Consequently, the device shown in Figs. 6 and 7 was constructed, which consists of a nose made of paraffine attached over an opening in a glass jar, beneath the opening being placed a petri plate of nutrient agar and the suction apparatus being attached to the jar. Tests were made with a spray of a prodigiosus culture and with varying thicknesses and mesh of gauze. Very many tests were carried out using variations of this method and with various kinds of controls. It was determined that with a mask made of ganze of ordinary quality, 24x28 threads to the square inch, an efficiency of 38% was obtained with six layers, and 56% with eight layers. Using gauze of a mesh of 60x72 threads to the square inch, which is so fine that breathing would be difficult with more than two layers, it was found that five layers were necessary to obtain an efficiency of 57%, six layers for 47% and eight layers for 98%.

The possibility of conjunctival infection must not be overlooked. The conclusion from these experiments is that while gauze masks exercise a certain amount of restraining influence in the number of bacteria laden droplets capable of inhalation, the forcible aspiration of droplet laden air through the meshes of the gauze increases the number of colonies possible to obtain over the method previously used in testing of allowing the droplets to fall by gravity through the gauze. It is further concluded that the degree of efficiency that it is possible to obtain has not been demonstrated by the experiments to be such to warrant their compulsory application for the checking of epidemics.

SOME CLINICAL FEATURES OF THE PRESENT PANDEMIC OF INFLUENZA AS COMPARED WITH THE PANDEMIC OF THIRTY YEARS AGO.*

By H. LISSER, A. B., M. D., San Francisco, Instructor in Medicine, University of California Medical School.

For every infectious disease, many complications have been described. In pandemics of influenza where such an enormous portion of the population is attacked, opportunity is afforded for a surprisingly large variety of complications. It would be utterly beyond the scope of a 15-minute paper to even itemize these numerous peculiarities of the influenza virus. Even Leichtenstern's masterly monograph of 200 pages in Nothnagel's System of Medicine, which probably is the most comprehensive survey of the great pandemic of 1889-91, barely touches upon a vast number of the influenza complications. The following observations are purely personal ones obtained through experience at the University of California Hospital and in private practice and I shall only dwell on a few features that attracted my attention during this time.

The fact that struck me most forcibly after studying Leichtenstern's work was the amazing similarity between these two pandemics. I say amazing advisedly because doubtless many of us were under the impression that our pandemic presented many extraordinary features. For example, it has been repeatedly emphasized that the present outbreak of the disease confined itself in the vast majority of cases to adults between 20 and 40 years of age, as though this were a new phenomenon; a great many of us expecting that the elderly part of the population would be most seriously affected. However, this was precisely the case in the pandemic 30 years ago. In fact, it would seem that we know but little more about influenza today than was known 30 years ago. This would appear surprising in view of the great developments that have occurred in medicine during these past 30 years, particularly in the elaboration of laboratory technic. We would hardly have expected much addition to our knowledge in the realm of pathology and perhaps not in clinical observation, but we were rather prepared to have advances in bacteriology, immunology and serology. Even this does not seem to be the case. Although the pandemic of 30 years ago ended with the strong impression that Pfeiffer's bacillus was the cause of influenza, nevertheless the writers of that time found streptococci, pneumococci, and other organisms and the more conservative authors very properly ascribed many of the complications and confusing pictures of the disease to the results of

*Read before the Forty-eighth Annual Meeting of the of the Medical Society, State of California, Santa Barbara, April, 1919.

mixed infection. Particularly was this the case in respiratory manifestations, more especially pneumonia. Opportunity has been utilized at this time for vaccination and serum therapy which was prophesied by Leichtenstern; probably more spinal fluid examinations have been made which were not done 30 years ago, and it would seem that far more blood counts were done during our pandemic, but when all is said and done, one must admit that our knowledge is but little more than the clinicians possessed 30 years ago. Perhaps the strong suspicion that pandemic influenza is due to a filterable virus, and that Pfeiffer's bacillus, pneumococci and streptococci, play only a secondary, though important role, would seem to be the one outstanding contribution of the present pandemic. It is only fair to remark that the literature on the present pandemic is only beginning to be written; that a large number of our profession have been extremely busy with military service and the remaining part overwhelmed by the care of influenza patients and that the requisite leisure time for compiling observations, sifting them and reporting them has been exceedingly limited. The publications of the immediate future may possibly bring forth some important discoveries, but no announcement of their appearance has been made as yet.

Since, then, it is quite impossible to cover thoroughly even a small portion of the clinical manifestations of this disease, I shall select only a few features and compare their occurrence in the two pandemics. Leichtenstern made three great subdivisions in describing the clinical course of influenza. The most prevalent form of the disease was the respiratory form. Most frequent manifestations were tracheitis, bronchitis and the several types of pneumonia. Laryngitis, rhinitis, empyema and the effect upon tuberculosis were likewise noted. This great preference of influenza for the respiratory tract has repeated itself in the present pandemic and no further allusion to it will be made. The second subdivision based upon the frequency of its appearance was the nervous form and that is probably also the case in this pandemic, but since complications of the nervous system manifest themselves frequently only as requelæ rather than complications during the height of the disease, such manifestations will probably come into the literature within the next few months. However, delirium and maniacal excitement during the height of the fever, even to the extent of suicide, have been reported frequently during this pandemic and the various psychoses, euphoria and its opposite, melancholia and profound depression, are being noted more and more every day. Likewise the prevalence and persistence of neuritis are making themselves known, and whether this will be as frequent as it was 30 years ago remains to be seen. Encephalitis lethargica is again following upon the heels of the pandemic, as it did 30 years ago. The third subdivision made by Leichtenstern referred to the gastro-intestinal form of the disease, and our experience in this pandemic has disclosed a very fair proportion of these cases. It was interesting to note how many of these patients complained exceedingly of nausea and vomiting, loss of appetite, and diarrhœa without any respiratory signs or symptoms whatever. A recent article by Beals, Blanton and Eisendrath deals with the abdominal complications of the influenzt pandemic, and abdominal pain, rigidity, peritonitis, subphrenic abscess and rupture of the rectus muscles are reported. During the present pandemic, many clinicians committed themselves to the opinion that the spleen was enlarged in the majority of the cases while others felt that this occurred only in rare exceptions. Curiously enough, this same diversity of opinion obtained 30 years ago and the conclusion was reached that this difference of opinion was due to considering the spleen enlarged when the area of splenic dullness was increased even though the spleen was not palpable. Cabot, one of the authorities in physical diagnosis, never considers the spleen enlarged unless it is palpable and upon this basis, it is probable that the spleen in influenza is not enlarged in the great majority of cases. True, jaundice was but rarely observed in 1889 and this seems to be the case again this past year. Several authors 30 years ago considered jaundice a diagnostic sign but based this idea upon a slight icteric tint of the sclera, but true jaundice was quite rare and was practically always observed as a toxic jaundice in fatal pneumonia. In about 250 cases of influenza that I studied personally only one case of jaundice was noted; this was extremely severe and was also a complication of a fatal pneumonia.

The temperature curves 30 years ago seem to resemble very closely those of the present pandemic. Most of them were 3-day fevers, a fair number 5-day fevers and a few 7-10 days and occasionally a malarial-like temperature and more rarely still a protracted typhoid-like fever curve was described. As an example of the latter condition, I should like to report briefly a case of a young dental student aged 18. His chart is represented in Figures I (a, b and c).

As you will note, he had a brief influenza temperature for two days, then was normal for two days, and then began with an oscillating temperature which continued for 3 days and then changed into a curve strikingly suggestive of tertian malaria. As it happened, he had had malaria frequently between the ages of 7 and 15 and, as a consequence, a palpable spleen, and we were therefore suspicious that his malaria might have been lighted up by the influenza. Parasites were patiently searched for during these days for many hours at a time and if it had not been for a stringent rule of the Medical Department that no cases be treated for malaria before the parasites be found, we would have been sorely tempted to administer quinine to this patient. It will be seen that after three such paroxysms his curve changed its character and he then proceeded to exhibit a temperature up to 102 and 103 every afternoon for somewhat over three weeks. During this time, every complication was searched for. Repeated blood cultures on many different media were made and were all negative. A lumbar puncture was done

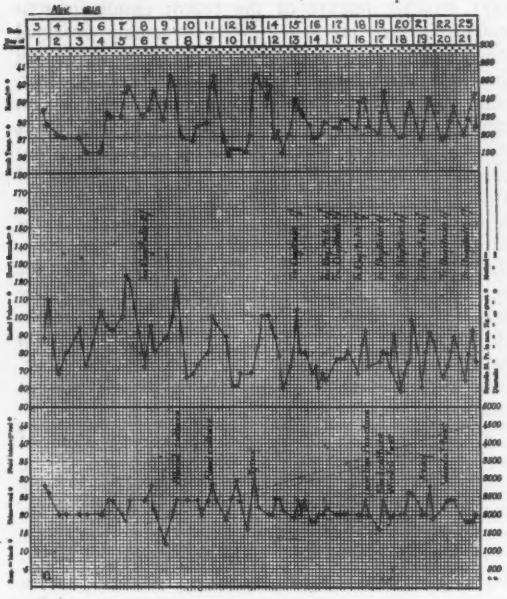


Chart I.

Figure I (a, b and c).

Case of influenza, showing temperature curve like tertian malaria for 6 days, and then protracted fever cure for 4 weeks more. No complications except purpura. Duration of fever, in all 40 days.

Chart II.

which was negative. His urine was cultured and was negative. His stools were cultured without result. His prostate and seminal vesicles were investigated. His sinuses and ears were carefully examined. X-rays of his chest were taken. All without result. A Widal was positive but this was explained as having no significance because he had had three injections prophylactically of paratyphoid, A and B, and typhoid, the last one two weeks before his influenza. Urine was injected into a guinea pig; X-rays of his teeth were taken; X-rays of his sinuses made; Von Pirquet tests made; exploratory puncture of his thorax was done even though no clinical signs were promising enough to hope for any result. It may, therefore, be considered that all clinical and laboratory means were utilized to account for this protracted temperature but absolutely none found. During this entire time, he had no signs or symptoms whatever and complained of nothing except a feeling of warmth when his temperature went up in the afternoon. Needless to add, his lungs were repeatedly examined and nothing found. After his temperature once became normal, it remained so and he has been perfectly well for three months and has regained his lost weight and vigor. The temperature remains unexplained therefore, except as an example of the protracted typhoid-like temperature described 30 years ago.

Three features that have attracted great attention during this pandemic are the marked cyanosis in those suffering from pneumonia, the tendency to hemorrhage and the high mortality in pregnant women. Cyanosis is mentioned in the pandemic of 30 years ago, but one gathers from reading the reports of that time that the cyanosis was not as extreme as was observed in this pandemic. It was repeatedly noted in our pandemic that patients had hemorrhage from the nose, lungs, stomach, intestines and uterus. Considerable interest was attracted to these happenings as though they were something new in influenza, but this same hemorrhagic tendency was emphasized 30 years ago and attention was called to the fact that the menstrual period was brought on ahead of time by the disease or that the bleeding was considerably more copious. The hemorrhagic type of pneumonia was also commented upon at that time. In fact, Leichtenstern notes "that one peculiarity of influenza well known since the oldest times (Wittich 1580) is the tendency to hemorrhage of various kinds." He calls attention to the frequency of hemorrhage from the nose, gums, pharynx, larynx, intestinal and renal hemorrhages as well as menorrhagia and metrorrhagia; further that the inflammatory processes in the serous and other membranes of the brain, in the intestine and stomach, in the middle ear and tympanic membrane have frequently a pronounced hemorrhagic character. Thirty years ago there were those who considered influenza as primarily a disease affecting the blood and that fundamental and deep-seated changes occurred in the blood during a very short time. Leichtenstern, however, thinks the marked tendency to hemorrhage is somewhat explained by the vasomotor hyperemia which characterizes all the inflammatory phenomena occurring in influenza. In my small series of about 250 cases, I had the opportunity of seeing examples of most of these varieties of hemorrhage. We had, of course, many cases of epistaxis, a few of bleeding from the ear, a great many of menorrhagia and metrorrhagia, one case of gastric hemorrhage, a case of intestinal hemorrhage and one case of purpura. Purpura is

mentioned as of frequent occurrence 30 years ago, but I have only heard of three cases in San Francisco, although there were probably more. One of these cases we had the opportunity to observe. See Figures II and III. This happened in the same individual whose temperature chart has been exhibited. The study of his blood showed a diminished number of platelets, but his prothrombin, fibrinogen, coagulation time and bleeding time were practically normal.

It was noted 30 years ago that influenza caused a great number of abortions and this was thought to be due to hemorrhages in the membranes and the statement was made that abortion occurring during influenza pneumonia made the prognosis considerably more grave. These hemorrhages occurring from abortion are sometimes of an alarming nature. The history of influenza from the oldest pandemic to the present day establishes the fact that influenza very frequently caused premature birth. This appears also from the marked decrease in the birthrate during the months following the pandemic. I believe that most of us had the impression that the recent influenza was alarmingly fatal to pregnant women. I have found no such assertion in the literature of 30 years ago except as above noted that it is apt to cause abortion. Most of us have heard statements to the effect that the average mortality in non-pregnant women has been about 6% and that the mortality in pregnant women has been anywhere from 50 to 90%. It would seem, however, that such impressions are exaggerated and are not borne out when a large number of statistics are collected. The Department of Obstetrics at the University of California called my attention to this shortly after our last outbreak. A recent compilation of 1350 cases of influenza in pregnant women by Dr. John W. Harris of Johns Hopkins also tends to substantiate the opinion expressed above that our notions of percentage of mortality are much exaggerated. He reports a total mortality of 25%, stating that 50% of the patients developed pneumonia and of the pneumonias 50% died, giving a total mortality of 25%. He also made the observation which coincides with that of 30 years ago that influenza is more fatal where the pregnancy has been interrupted than in those cases where it has continued. It is even questionable whether the mortality is as high as 25%, as it must be admitted that the above 1350 cases were the more severe ones that most impressed the physicians reporting the cases.

Two points of clinical interest that are at great variance, however, with the reports of 1890 are first, the mortality (at least in the United States), and second, the number of white blood corpuscles. The mortality from influenza has always been thought to be very low, especially when compared to the enormous number of people attacked, namely, .2 to .5%, whereas in the United States the mortality has averaged about 6 to 7% during the last pandemic and as high as 12-14%. Leichtenstern remarks that leucoytosis was the rule in 1889-91 and that statement has been reprinted in the textbooks since that time, whereas it was a most striking feature of the recent pandemic that leucopenia was the rule. We invariably obtained a white count of between 2000 and 5500 during the first three days of the disease and, in fact, came to depend on this finding for a diagnosis in doubtful cases and differentiated in our own minds at least between common colds (rhinitis, laryngitis, tonsilitis) and influenza by tthe presence of either leucopenia or leucocytosis. The higher mortality and the finding of leucopenia seem, therefore, two distinctive features of this pandemic. However, it may be that blood counts were not done as often 30 years ago during the first few days but postponed until the disease became serious and pneumonia supervened, which would explain the prevalence of leucocytosis 30 years ago. For, with the appearance of pneumonia in the present pandemic, leucocytosis usually occurred.

Finally, a few words about a certain type of heart disease that results from influenza. The condition I refer to is somewhat similar to the irritable heart of soldiers and sailors that has received so much attention during the past few years. It presents the following features. Patients that seem to be recovering normally from influenza rather suddenly at times begin to suffer from tachycardia, some precordial pains, weakness, and exhaustion after the most trivial exertion. The pulse rate will range from 100 to 160 and this even when the patient is absolutely at rest in bed. This condition continues for weeks and months and is exceedingly obstinate to every form of therapy. Digitalis, bromides, rest cure, X-ray treatments to the thyroid gland, ice pack to the heart and many other measures are of absolutely no avail. It is exceedingly stubborn in its persistence, as I have had occasion to note in 3 cases under observation; one in a man of 50 years, one in a woman of 45 years and one in a young nurse of 20 years, where the tachycardia and other signs just described have persisted for 5 to 6 months and seem but little better today than they were six months ago. On examination, the heart, as a rule, shows but little evidence of disease. There are no signs of endocardial involvement, sounds are normal in clarity and strength. The size of the heart is usually normal and if it were not for the pulse rate, no objective sign could be found and the individual might be readily considered to be neurasthenic. The weakness of these patients is extreme. The man of 50 to whom I refer was a remarkably strong individual for his age before attacked by influenza. He can walk now on the level very slowly for a few blocks but becomes easily fatigued and then is pathetically weak. The woman of 45 has been unable to attend to any of the ordinary duties of the household and, in fact, has spent the greater part of the last few months in bed. The young nurse of 20 has recently attempted to return to her duties but is unable to continue with even the lightest sort of work and will undoubtedly have to cease her training as a nurse.

I examined her as recently as April 3 and her pulse after sitting quietly for 15 minutes was 150. We seem as helpless in the face of this condition

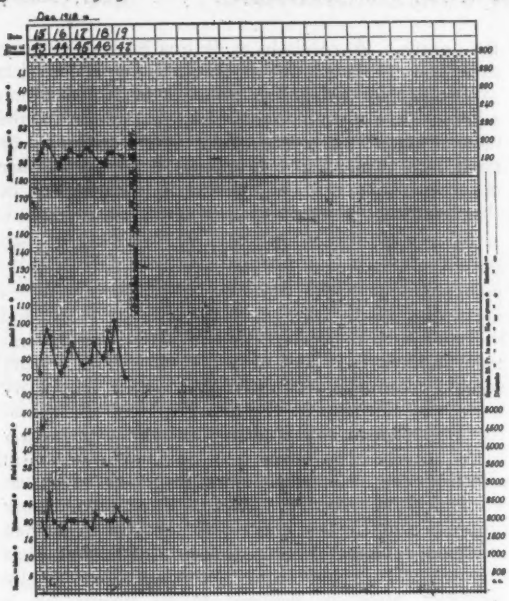


Chart III.

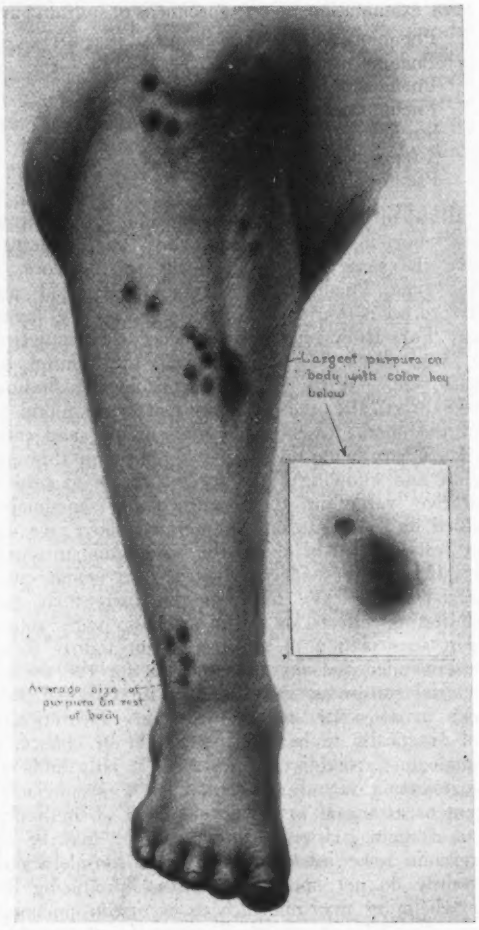


Figure III.
Same case as Figure II, showing purpuric lesions on right leg.

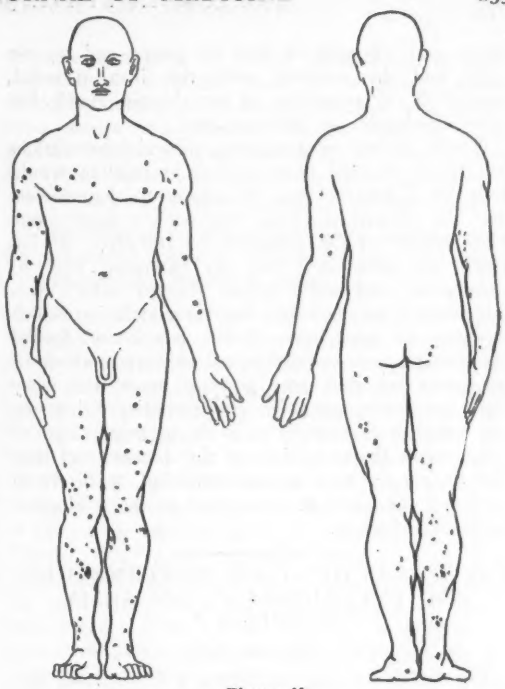


Figure II.
Case of influenza with purpura, showing distribution of purpuric lesions.

as were our predecessors of 30 years ago. The same heart weakness is mentioned by Leichtenstern as follows: "Influenza is frequently followed by serious, long continued and persistent functional disturbances of the heart of a neuropathic and myopathic origin. We frequently saw vigorous people in the prime of life who some weeks after recovery from an attack of influenza complained of shortness of breath, attacks of angina pectoris, palpitation of the heart and inconvenience, in whom there was an occasional marked tachycardia and no other signs of cardiac affection could be found." He thinks that occasionally there were changes in the heart muscle but feels that the majority of these cases have a nervous origin and are due to the influence of the influenza toxin on the nervous mechanism of the heart and, in support of this view, he mentions the transitory character of many of the cardiac disturbances and their acute occurrence, the arythmia in individuals with apparently quite healthy hearts; also the fact that with these cardiac manifestations, even when chronic, he saw no signs of disturbed circulation, as congestion of the liver or the kidneys, or anasarca, which could hardly be absent with degenerative processes of the heart muscle. In favor of this neuropathic origin of these severe cardiac manifestations after influenza is the fact that frequent post-influenzal neurasthenia often seems to have a cardiac basis in that it is accompanied by marked subjective and objective cardiac manifestations. Some of the authors who have written extensively on the irritable heart of soldiers, in many respects a very similar condition, try to ascribe the tachycardia and other symptoms to over-activity of the thyroid gland, a sort of Graves' disease. The nurse referred to reminded us also of this possi-

bility even though she had no goiter and no eye signs and she received, with this idea in mind, several X-ray exposures of her thyroid gland, but with absolutely no improvement.

There rather fragmentary clinical observations which are selected more or less at random would seem in a general way, therefore, to demonstrate that the present pandemic has been a fairly complete replica of the pandemic of 1889-91. It has given an opportunity for an extensive trial of vaccination and some serum therapy which was not possible 30 years ago, but the conclusion which it seems we must make is that our knowledge of the clinical course of influenza and our methods of treatment are the same and no more than they were 30 years ago, with the exception—that we can establish leukopenia as a characteristic sign of influenza in the early days of the disease; and that like dengue, a very similar infection, a filterable virus will probably be discovered as the etiological agent of influenza.

THE TREATMENT OF POST-INFLUENZAL PNEUMONIA IN AN ARMY HOSPITAL.*

By W. W. ROBLEE, M. D., Riverside, Cal.

The Influenza epidemic threw a sudden and immense strain upon the Army hospitals. Because of the concentration of the men in barracks, the spread of the disease, once it was introduced, was rapid and apparently uncontrollable. It was my fortune to be Chief of Medical Service at the Embarkation Hospital at Newport News, Virginia, at that time. We received patients from our local camps, troop trains, Army transports and the Merchant Marine. The ambulances were busy day and night transporting the sick, and ofttimes dying, soldiers to us for care. The epidemic ran its course in six weeks, but those were weeks of strenuous endeavor on the part of the entire hospital staff. During the month from September 20th to October 20th, 623 cases of Pneumonia entered our Service. There were 161 deaths, giving us a mortality rate of 25.8 per cent.

As a result of our experience with these cases and over 800 Pneumonia cases preceding the Influenza epidemic, a series of 1500 in all, I would sum up the treatment of Pneumonia in one word, *"Individualization."* It is absolutely essential that every pneumonia patient become known and watched by both surgeon and nurse.

When the seriousness of the epidemic manifested itself and it became evident that surgeons, nurses and enlisted men would become seriously taxed before it ended, measures were taken to cut unnecessary labor to a minimum. Paper work, reports, routine ward work, temperature taking, etc., were all reduced to the bare necessities of the case, in order that the sick men could have the undivided attention of the entire service. The most competent ward surgeons were placed in the pneumonia wards, and by order of the Commanding Officer were excused from all duty outside the wards. A specially well qualified pneumonia expert was placed on night duty, in order that expert service might be given during the hours when it is ordinarly handled by an officer of the day, or night inspector, whose intentions may be good but, if perchance he comes from some other department, he may be helpless in the treating of these cases.

Specific Therapy. The sputum was typed after the Avery method in all cases. The Type I pneumococcus cases were given serum unless, as not infrequently was the case, a crisis came and the pateint became convalescent before the laboratory findings had been returned to us. No other specific treatment was attempted. Our laboratory force was untiring in the effort to find the causative organism in this epidemic and we were nearly forced to the conclusion that no known organism affecting the respiratory tract could be given an ætiological role therein. Reports from other Army hospitals confirm our conclusion that the Influenza infection seldom, if ever, causes death, but that the mortality comes from secondary invasion by whatever organism happens to be present in a given locality.

An examination of 677 specimens of sputum gave:

Pneumococcus I	8.1%
Pneumococcus II	.3%
Pneumococcus III	0
Pneumococcus IV	58.4%
Streptococcus Viridans	32.2%
Streptococcus Hæmolyticus	.3%
Pfeiffer Bacillus	.3%

Bloodcultures from the living and cultures from post mortem heart's blood and lung punctures gave the same findings. With us, therefore, at that time Pneumococcus Type IV-Type I and Streptococcus Viridans were the secondary invaders. Fort Riley reports Streptococcus Hæmolyticus in large numbers. Camp Deven, the Pfeiffer bacillus, etc. With us, the bacteriological findings were practically the same as had been found in our pneumonia cases during the summer and early fall. There being no specific organism in this epidemic and knowing of no specific serum of proven curative value in the treatment of pneumonia caused by the organisms enumerated above, we did not feel justified in giving the "shot gun" mixtures so quickly and widely advertised by some commercial firms. We felt that the discomforts and debilitating effects of serum sickness, with subsequent sensitization to all sera, is not lightly to be recommended for any patient. As for the use of bacterial emulsions, vaccines, etc., for curative purposes in an acute infection they are theoretically and practically to be condemned. If by chance, a homalogous strain is administered, it only adds to the toxæmia already present. As a prophylactic agent or as an aid to the development of immunity in a dragging, chronic condition, they may be of service in some infections, but those considerations certainly do not apply to a disease producing an overwhelming toxæmia such as occurs in pneumonia. We did not use blood serum from convalescent cases intravenously. A study of early reports

*Read before the Forty-eighth Annual Meeting of the Medical Society, State of California, Santa Barbara, April, 1919.

on this method of treatment did not convince us that better results were being obtained than was the case with us by our well-tested methods. To be safe and of service, the blood must be secured (1) from a patient who has recently had Pneumonia of the type from which the patient, who is to be transfused, is suffering; (2) a donor well enough to stand the loss of blood must be found; (3) his blood must not agglutinate that of the patient; (4) he must be free from latent syphilis, tuberculosis or other infective organisms; (5) the procedure must be carried out before the patient is in extremis. All of these considerations entail a burden of laboratory work that is impossible during the progress of an epidemic such as we have recently experienced.

Morphine: This point in therapy, we believe to be of prime importance. Small doses of morphine frequently given, and if necessary an occasional larger one, control restlessness, delirium and cough and thus conserve the strength of the patient. Many patients wear themselves out unless the sedatives are given. The old idea that morphine in some mythical manner locks up secretions (whatever that may mean) and that it causes an accumulation in pneumonia is absurd. The idea that the patient must be encouraged to cough up the secretion is wrong. A major portion of the material causing the consolidation in pneumonia is carried away by the circulation and is not expectorated via the bronchial tubes and trachea. The use of morphine is, in our experience, a life-saving measure.

Digitalis: Was given in a large series of cases, and the opinion that had been forming in our minds during our previous experience was confirmed. We concluded that it is of distinct value when dilatation is beginning or fibrillation present and as a prophylactic in the prevention of these conditions, but that it is of doubtful value for the gradually ascending heart rate and weakness of severe toxæmia. When given, it should be crowded until either steadying or block develops. The tincture supplied at this hospital could be given in four cc. doses every two hours until fifty cc. had been given, then in one cc. doses until the effect desired had been obtained, which is usually reached at sixty or seventy cc. We felt that camphor is more valuable as a stimulant in toxæmia than is digitalis; that it is somewhat sedative to the nervous system and has some probable value as a meningococcocide.

Salt Solution was given intravenously in a series of cases, and we feel that some patients were carried over the danger period by that means. It should not be used in most cases of broncho-pneumonia. It simply adds to the work of the heart and increases the "water-logged" condition of the lungs. Its value, if any, is in selected cases of lobar involvement showing depression of body and mind. Salt Solution intravenously and whisky by mouth are then of real value.

Lactose in 5% solution was given intravenously to the slender, dry-skinned cases who manifestly had a small accumulation of fuel to carry them through their time of stress. Bicarbonate of soda and glucose solutions were given freely, intravenously and by proctocclysis, to those who developed nausea and vomiting, on the theory that an acidosis probably was present. Our overworked laboratory force was unable to undertake investigations looking toward the settling of that point.

Turpentine stupes and soap suds enemas, with an occasional dose of pituitrin, were our chief dependence for abdominal distention.

Baths: After a large series of cases had been studied, we came to the conclusion that baths given for the reduction of temperature were of no value and were, in fact, often a detriment to the patient. A quickly given tepid sponge-bath once or twice daily, with as little disturbance of the patient as possible, was given and no attempt made to use other hydrotherapeutic measures.

Diet: Simple as possible. No effort was made to crowd the feeding during the acute stage of the illness. Fruit juices, to which plenty of sugar was added, milk and whisky were given if the patient did not object, and the free drinking of water encouraged. The use of alcoholic stimulants in pneumonia is a debatable subject. We used whisky very freely in some wards, none in others. As a final conclusion, we feel that it has three points of usefulness:

1. As a food and fuel supply in slender, dry-skinned patients.

2. As a sedative in delirious cases. Whisky given freely in many of those cases has a soothing effect and helped control the delirium. A gentle "jag" seemed to us to be of service in those cases and we do not believe that it in any way added to the toxæmia.

3. Small amounts, 15 cc. once in three hours, was a very grateful bracer to the average patient, especially the depressed, exhausted type. We are aware that these views do not correspond entirely with the theoretical conclusions as to alcohol and its physiological action, but given a patient whose vital reactions are modified by the toxins of a severe acute infection, we feel that practically we are justified in the above conclusions.

All serious cases, so far as possible, were treated on porches until convalescence was well established.

The complications in our Pneumonia cases during this epidemic were not numerous, but were very interesting. This we account for by the fact that the one organism for which the army early acquired a very hearty respect, the streptococcus hæmolyticus, was practically absent in our locality during this epidemic. During the spring months, we had a very serious experience with it and it was occurring with increasing frequency during the last month of my service, December.

A few cases of empyæma developed, and our experience coincides with that of the other army hospitals. Costectomy should be employed in all cases which develop pus, but not during the stage of acute pneumonia or active pleurisy. If necessary to relieve the embarrassed respirations during that period or before rank pus develops, aspiration

may be performed. We did not employ lavage by Dakin's Solution. Our results were entirely satisfactory by drainage following costectomy done under local anæsthesia.

Twenty-six cases of meningenismus occurred among our pneumonia patients. All gave a sterile spinal fluid and improvement in the nervous systems usually followed the puncture. During this time, we were caring for seven cases of meningitis in our meningitis ward, but as none were complicated by pneumonia, they will not be discussed here.

Otitis media and sinusitis were seldom seen and of mild character. No mastoids became involved. Here again, we believe the absence of streptococcus hæmolyticus to have accounted for our escape from serious consequences.

Hemorrhages from nose, lungs, stomach, rectum and bladder were observed. No specific treatment was undertaken for the condition, as we did not feel that there was sufficient loss of blood in any case to jeopardize the patient's chance for recovery.

Pericarditis, endocarditis and post infectious myocardial weakness were remarkably absent. Most of our cases made a very prompt recovery and comparatively few were obliged, because of myocardial weakness, to remain in the hospital beyond the thirty day fever-free period which was our rule for the discharge of pneumonia cases. This, we again attribute to the absence of streptococcus hæmolyticus during this epidemic. I do, however, want to stress the importance of the after care of the heart in pneumonia. We became convinced, after our experience during the winter and spring with certain type pneumococcus and streptococcus hæmolyticus pneumonias, that toxic myocarditis was a sequel of these cases in a very large percentage of cases and that too little attention was given to it during convalescence by the average physician.

Figures given below, compiled from the record of our pneumonia convalescent ward for a series of 270 cases, studied between April 15th and August 15th, prior to the influenza epidemic, give myocarditis requiring special care and prolonged rest in 120, or 44.4%. The streptococcus hæmolyticus was an active factor with a percentage of this total of 45.76. The following table, compiled by Lieut. W. M. Scott, surgeon in charge of this ward, gives the figures for the series. From April 15th to August 15th, 1918, there were 270 convalescent pneumonia cases admitted to the ward. Of this number, 120 had post infectious myocarditis as a complication (44.4%).

Type of Organism.	Number of Cases.	Per Cent.
Streptococcus Haemolyticus	55	45.76
Streptococcus Viridans	12	10.00
Pneumococcus Type I	15	12.50
Pneumococcus Type II	2	1.66
Pneumococcus Type III	1	.83
Pneumococcus Type IV	25	20.80
Streptococcus Haemolyticus and Streptococcus Viridans	3	2.50
Streptococcus Viridans and Pneumococcus Type I	1	.83
Not typed	4	3.33
Pneumococcus Type IV and Streptococcus Viridans	1	.86
Staphylococcus Albus	1	.86

Prolonged rest in bed often sixty or ninety days, followed by painstaking re-education and strengthening of the heart muscle by graduated exercises, is of prime importance and will save many a patient from life-long invalidism due to a permanently damaged heart caused by too early physical strain. I have seen hearts which were spread out in all directions and with murmurs at every arifice under this plan regain tone, reduce in size and the murmurs disappear. Incidentally, I might add that too much stress has been laid upon the dilated right heart in pneumonia. Dilatation, when it occurs, is due to toxic myocarditis. All chambers are involved and usually the left ventricle is much more spread out than is the right. Watch your pneumonia hearts carefully and you will find that I am correct.

We saw occasional cases of arterial and venous thrombosis, the abdominal syndrome simulating appendicitis or cholecystitis, psychoses, convulsions and subcutaneous emphysema, all of which required careful study and appropriate treatment, which I will not take time to speak of here unless requested to do so in the course of the discussion.

Subcutaneous Emphysema: This developed as a complication in seven pneumonia cases. The subcutaneous tissue of the neck, chest, abdomen, scrotum and thighs became involved in the order named. Four died. One of the cases that recovered had marked swelling and crackling upon palpation from neck down to both knees. The neck and chest in these cases became greatly swollen, the temperature did not run high and death, when it occurred, came from gradual circulatory failure. Subcutaneous punctures for culture purposes were made and no bacillus Welchii or other organisms were found. One case came to autopsy and air was found present in the pericardial sac and mediastinal spase in addition to subcutaneous tissues. No ulcer or other pathological opening into the lung was found, but we are nevertheless of the opinion that the emphysema was due to leakage of air and not to gas bacillus infection.

PULMONARY CONDITIONS WRONGLY DIAGNOSED AS TUBERCULOSIS.*

By WILLIAM C. VOORSANGER, M. D., San Francisco.
Discussed by Dr. Hurwitz, Dr. Pottenger, Dr. Shortle, Dr. Voorsanger.

The studies of recent years upon sputum cultures, particularly the work of Luetscher, the investigation upon the agglutination of various bacilli and particularly the more recent work in government laboratories and army base hospitals, have greatly upset conventional clinical methods of diagnosis and have made us realize that many pulmonary conditions which in the past we looked upon as tuberculosis were in reality something else. An internist recently made the statement that "tuberculosis men were responsible for diagnosing every pulmonary condition as tuberculosis." This might have been the case at one time, but I feel sure that every real "tuberculosis man" today undiagnoses tuberculosis as much as he diagnoses it. Sanitarium physicians have often made the

*Read before the Forty-eighth Annual Meeting of the Medical Society, State of California, Santa Barbara, April, 1919.

statement that from 7 to 10 per cent. of cases entering a tuberculosis institution did not have tuberculosis. The best authorities and text books have constantly advised that, if possible, tuberculosis should be diagnosed before tubercle bacilli are discovered in the sputum—this contrary to the original teachings of Koch. As is well known, the reason for this is that, supposedly the presence of tubercle bacilli in the sputum indicates breaking down of lung tissue, and our object is plainly to clinically detect a lesion in its incipiency, or inflammatory stage, before ulceration or necrosis takes place. Naturally, this theory, good as it is, led to many errors in diagnosis, since we began to depend too much upon the clinical picture of past history of malaise, cough, expectoration, night sweats and loss of weight. The pendulum swung too far the other way. The laboratory which first displaced the clinician was in its turn displaced. Now we are going to combine the two with, it is hoped, better results in diagnosis and the saving, as I will show later, of a considerable number of lives.

Pulmonary diagnosis was greatly advanced by the work of (1) Cole, Dochez and Avery in their epoch-making investigations in pneumonia, for they clearly demonstrated that there were four types of pneumonia and that proper sputum cultures would definitely show with what type we had to deal. The result was a vaccine curative for Type I, helpful in Type II and non-efficacious for Types III and IV. They also showed the prognostic value of careful sputum cultures in the fourth or so-called indeterminate type of pneumonia. I dwell upon the work of these investigators because what has been accomplished with pneumonia through intelligent laboratory work can unquestionably be accomplished in all pulmonary conditions.

Luetscher (2) in 1915, undertook the study of sputum to give us "wider knowledge of what lesions a given organism may produce." These cultures show that each organism may produce a variety of accute lesions. Particularly significant was the demonstration that the influenza bacillus and pneumococcus may produce chronic lesions extending over many years. Naturally, this has a tremendous bearing in proving whether lesions are tuberculous or not. Luetscher's work is unquestionably the beginning of a new era in pulmonary diagnosis because it makes the laboratory a real aid to the clinician; nor can it be exnected that the latter can carry out this work himself; he must have at his command a properly equipped laboratory with trained workers. He should make a careful clinical examination—the laboratory gives him analytical and scientific information—from the two he should deduce a diagnosis. This statement seems hackneyed because we have for years made diagnoses in this way, but in pulmonary disease it takes on a new significance. To do the work required for modern cultural sputum examination requires laboratory knowledge of the highest character and few laboratories have the personnel necessary to give the clinician the knowledge he needs. This statement takes on a new significance because the laboratory can give us more than a diagnosis—it can direct our therapeutic measures. We have always assumed that all bronchial asthma was incurable and have simply sent the sufferer to another climate or made him a narcotic habitue. However, Chandler Walker, of Boston (3) has shown that asthma can be differentiated into types of those sensitive to bacteria and those sensitive to proteins. Of 28 patients treated with vaccines of bacteria to which they were sensitive, 75% were relieved and 21% were improved. These vaccines included the S. Pyogenes aureus, diptheroids and streptococcus. We cannot in this paper go into an extensive review of Walker's work. His most recent article, published in February, shows that of 150 non-sensitive asthmatics who were treated with vaccines, 40% were relieved and 20% were improved. This opens up a tremendous field for investigation, not only for asthma, but for all pulmonary disease.

The war has done much to clarify pulmonary diagnosis and therapy. Unfortunately, two great epidemics occurred. The streptococcus hemolytica scourge of 1917, and the influenza plague of recent memory. The great base hospitals of this country and Europe, manned by our best medical brains, thought they were dealing with an unusual epidemic of pneumonia until Cultural Examination proved that the pneumococcus was not the causal germ, but a hemolytic streptococcus.

At the last meeting of the American Medical Association held in Chicago, the section in general medicine devoted most of its time to the discussion of this epidemic. Reports of thousands of cases came in from various military hospitals all over the country. At this meeting Welch made the statement that "we must recognize in this condition a new disease and take measures to combat it if it occurs next Winter." But the "new disease" did not come back in 1918—instead, a new form of influenza with pneumococcus and streptococcus complications. It found us unprepared; we stood by helpless while hundreds of thousands died. Our drugs and vaccines were powerless. The camps, with their millions of inhabitants, again gave the opportunity for investigation of a large amount of concentrated material. Stone and Swift (4) reported observations on 15,170 cases of influenza, of which 2,624 had pneumonia. Opie (5) and his workers at Camp Pike, reported 12,293 cases of influenza, with 1,499 cases of pneumonia. The reports on the epidemics of 1917 and 1918, all over the country proved conclusively that we were treating pulmonary effects, the causes of which we did not quite comprehend. We thought we were dealing with pneumonia in 1917; we found out afterwards the real cause. We manifested our utter helplessness when Influenza raged and I doubt if there be any one bold enough to say that he even now thoroughly comprehends its etiology. We know that we have passed through no ordinary influenza epidemic; that an intensively toxic pneumonia was the cause of so many rapid deaths and that our sputum cultures demonstrated Influenza Bacilli, pneumococci and streptococci. And

still, a Commission from the best authorities stated that there was something about the etiology of this epidemic which could not be explained.

Nor have we explained why, in many cases, complications have arisen and are at this late date still arising. One hears on all sides the warning from physicians and health authorities that the epidemics of 1917 and 1918, particularly the latter, will greatly increase the incidence of tuberculosis. There can be no doubt that a certain amount of old, healed tuberculosis will be made active and that we will be called upon to treat these cases. I am convinced, however, from personal experience that many people are being stigmatized as tuberculous who have influenza and results, such as bronchitis, empyema, lung abscess and influenzal spots. These conditions will be taken up at length later. We know that the influenza bacillus may produce lesions indistinguishable from the tubercle bacillus.

In order to substantiate his own opinion that too much pulmonary tuberculosis was being diagnosed, the writer sent the following questionnaire to a few well known pulmonary authorities:

1. What percentage of cases admitted to your institution are non-tuberculous?

2. What percentage of cases with the usual symptoms of tuberculosis, particularly large amount of sputum, are tubercle bacilli-free?

3. What percentage of cases sent to you with the diagnosis of tuberculosis have you personally diagnosed as non-tuberculous?

4. What condition or conditions do you consider mostly confused with tuberculosis?

Answer from National Jewish Hospital for Consumptives, Denver, with 250 beds, handling incipient and moderately advanced cases, about 8% of cases are non-tuberculous, 10% of cases with usual symptoms of tuberculosis have tubercle bacilli-free sputum, 10% sent with diagnosis of tuberculosis have been diagnosed as non-tuberculous.

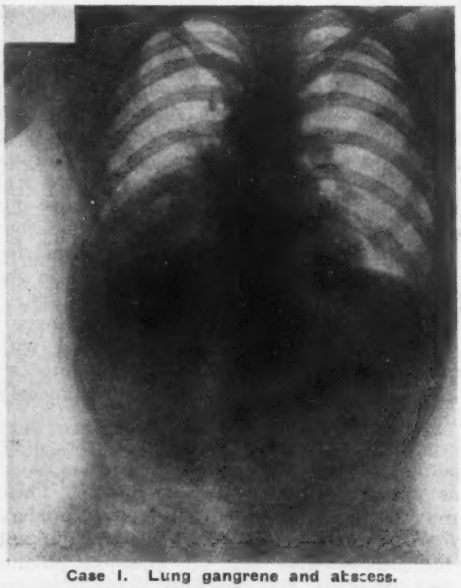
Lawrason Brown of Saranac states that 16% of cases admitted to the Trudeau Sanitarium are non-tuberculous. He finds thyroid adenomata one of the most frequent conditions confused with tuberculosis. Landis of the Phipps Institute states that the "conditions which are most often wrongly diagnosed as tuberculosis are those involving the bases of the lungs. For the most part these conditions are due to a chronic inflammatory lesion and are not infrequently associated with bronchiectasis. These mistakes have always seemed particularly inexcusable to me, in view of the well-established fact that tuberculosis in the adult practically never exists primarily at the base."

S. Simon, of the U. S. General Hospital No. 19 at Azalea, N. C., one of the largest tuberculosis hospitals in the country, states "that between 30 and 40% of the 2,500 patients admitted to the hospital since it opened a little over six months ago, were either non-tuberculous or had old and obsolete lesions which dated back to their childhood days and could not, by even the greatest refinement in diagnosis, be classed as clinically tuberculous."

Crouch, of the Woodmen's Sanatorium, states that 11% of their admitted cases are non-tuberculous.

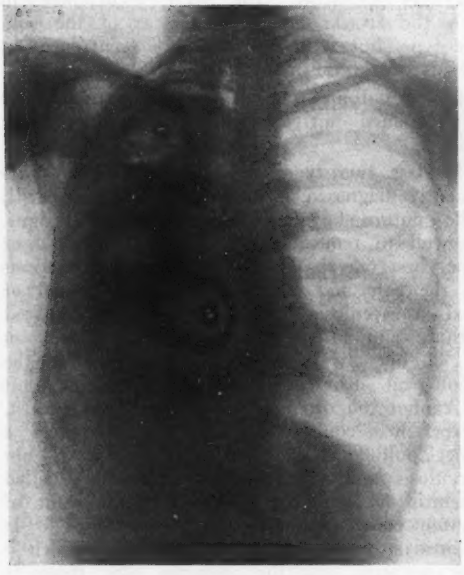
The histories of cases admitted to the writer's institution in the past five years, where but few cases are really incipient, still show approximately 16% tubercle bacilli-free sputum.

I realize the inaccuracy and futility of statistics. The experiences, however, of men handling large amounts of tuberculosis material prove that too great a percentage of non-tuberculous individuals are carelessly diagnosed and treated for tuberculosis. It is a well known fact that in a certain percentage of people with tuberculosis no bacilli can be demonstrated in the sputum. I am convinced, however, that many a person with a lung abscess or bronchiectatic cavity has coughed himself to death under a mistaken diagnosis of tuberculosis, when a surgical procedure might have cured him, or at least prolonged life in comparative comfort. In the past two years a veritable

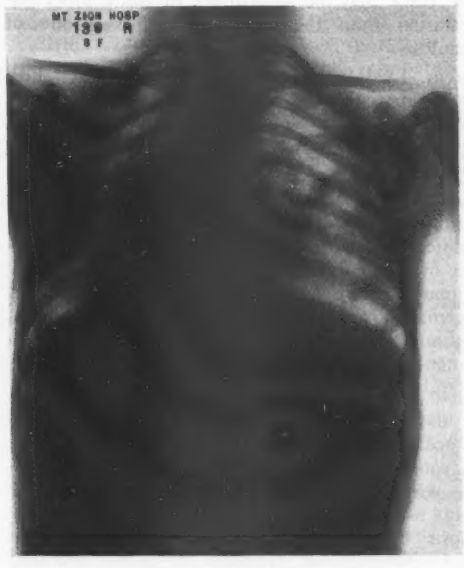


Case I. Lung gangrene and abscess.

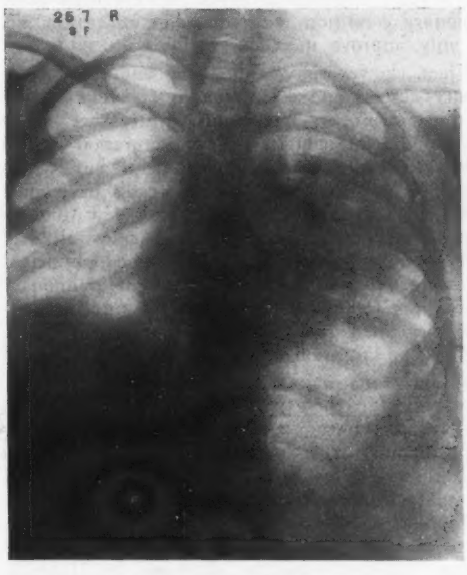
deluge of articles have appeared on the differentiation of tuberculous and non-tuberculous conditions, principally from the pens of "tuberculosis men," showing that they are at last fully awake to the importance of diagnosing tuberculosis only when it is really present, and to the injustice of stigmatizing a practically well man with the diagnosis of this disease. I would go one step further and state that we should attempt to diagnose only active tuberculosis or, if you like, clinical tuberculosis, with symptoms, since probably 85% of all of us have passive tuberculosis! In no spirit of criticism, we believe that our Army Doctors have been a bit over-zealous in their diagnoses of pulmonary tuberculosis. The Government has built eight splendid sanatoria with a capacity of 8000 beds, in various parts of the country, to take care of returning soldiers and sailors afflicted with tuberculosis. But is there not something wrong when one of our most experienced pul-



Case II. Right lung abscess.



Case IV. Right lung consolidation (influenzal spot).



Case III. Abscess left lung.

Case V. Pneumonic kiniosis.

monary experts states that 30 to 40% of 2,500 admitted cases were non-tuberculous? I have had numbers of men come to my office and show discharge papers reading "pulmonary tuberculosis" of an apex or lobe, who have absolutely no symptoms, with negative X-Ray pictures, but perhaps a little harsh breathing or a slight dullness. With all our present refined methods of diagnosis, indefinite clinical signs are really not sufficient. Lieutenant Colonel J. H. Elliott (6), Toronto, who had charge of a large military district with special reference to chest diseases, after two years' experience with many thousands of returned soldiers, makes this statement: "There is no doubt that 60 to 80% of the cases returned from over seas as tuberculosis suspects, must be classified as not suffering from tuberculosis." We agree with A. Trasoff (7) that the most important error to be avoided in the diagnosis of pulmonary tuberculosis in the Army is the mistake of the overzealous in declaring a normal chest tuberculous." Few know the normal chest—hence the errors!

Fishberg (8) quotes Blomel as authority for the statement that 80% of the incipient cases in the German Sanatoria are not at all sick, or suffer from some other disease, namely, non-tuberculous apical lesions.

J. A. Miller (9) says: "Certain physical signs

in the chest may be susceptible of quite other interpretation than the temptingly obvious one of tuberculosis."

Gavin, Lyall and Morita (10) state that "Pulmonary tuberculosis is frequently a disease with a wealth of physical signs and a poverty of symptoms, while in chronic non-tuberculous infections, the reverse is true."

Conditions usually confused with pulmonary tuberculosis are aneurysm, bronchial asthma, Bronchiectasis, Chronic Bronchitis, bronchial-pneumonia of long duration, chronic pneumonia, diaphragmatic pleurisy, echiccococcus cyst of the lung, Empyema, foreign-body, gangrene of the lung, Hodgkins' Disease, Hyperthyroidism, Influenza, malignant diseases, pneumokoniosis, pulmonary abscess and pulmonary infarct.

In the writer's experience, all these conditions have occurred. Of particular interest is the case of a young man who was referred by his physician with the statement "After observing this pateint for six months I have excluded every diagnosis but tuberculosis." This patient ran a cyclic-temperature of 6 days of fever reaching 104, and 12 days of normal curve, the cycle recurring with uncanny regularity. He had no symptoms of tuberculosis except this fever. He had a dull right apex and a few enlarged cervical glands. After six months' sanitarium observation, during which every possible laboratory test was made for syphilis, and relapsing fever, the patient was discharged as non-tuberculous. He died one year later from Hodgkins' Disease. The cases of hyper-thyroidism with temperature, loss of weight and a dull right apex are often seen in sanatoria and are called incipient tuberculosis. True, they improve under hygienic and dietetic regime, but they should not be stigmatized as tuberculosis. The scope of this paper will not permit of an analysis of all the above-named conditions, which are often wrongly diagnosed as pulmonary tuberculosis. We are more interested at present in a group of complications or sequelae of our recent epidemics, which may be classified, as already stated, under four headings, Bronchitis, Empyema, Lung-abscess and Influenzal spots.

(11) Gavin, Lyall and Morita report cases which they call chronic non-tuberculosis with the following characteristics: "Chronic cough and expectoration with periodic exacerbations, frequently with haemoptysis, extensive physical signs almost invariably affecting one of the lower lobes and strikingly little impairment of the general health, the infecting organism being most commonly the pneumococcus; less often the influenza bacillus, and still less the streptococcus. The influenza bacillus was the chief offender in 7 out of 8 cases reported."

J. A. Miller (12) classifies non-tuberculous diseases into:

(1) Sub-acute non-tuberculous pulmonary infection, in which the constitutional disturbances are moderate and of short duration, but in which the physical signs persist for six weeks to four months, but end in perfect recovery.

(2) A sub-acute type with recurrences in which the attacks are the same as in the sub-acute type, but with one or more recurrences at intervals of several months or years.

(3) A chronic type in which abnormal signs have remained fairly constant for a number of years.

The last two types of Miller's are the ones frequently diagnosed as tuberculosis without bacilli in the sputum, but with suspicious physical signs. It is well to remember that many physical signs in the chest may be given different interpretations than the easy and short-cut one of suspected or actual tuberculosis. Slight dullness, impaired breathing and rales, particularly if not over an apex, do not always signify tuberculosis, and the physiological difference between right and left apex cannot too often be emphasized. We must, if experience counts for anything, recognize a distinct pulmonary disease entity which is not tuberculosis and which perhaps has been called Bronchitis or Empyema, and which, for want of a better name, we call "non-tuberculosis." It simulates naturally the positive disease of which it is the negative, and the physician who treats it as tuberculosis should not be criticized too strongly. Besides, treating a chronic or even sub-acute pulmonary condition with rest, diet and fresh air, can only improve it.

When, however, we diagnose and treat pulmonary abscess and Empyema as tuberculosis, we do the patient an irreparable injury—we allow him to die of cough and expectoration which conservative measures will not help, but which radical surgery may cure. Three cases have come under my observation in the past few months which are here reported. These cases all had observation in good hospitals under good physicians and were sent with the diagnosis of pulmonary tuberculosis following pneumonia or influenza, because they had the classical symptoms of fever, cough, expectoration, haemoptoe and loss of weight.

In none of these cases were tubercle bacilli found in the sputum. All of them had a history of pneumonia or influenza. The X-Ray Plates in all showed free apices. The physical signs all pointed to basal or central lesions. It seemed easy to diagnose at least a condition of non-tuberculosis, but two cardinal points were forgotten (1) that copious purulent sputum showing no tubercle bacilli after repeated examinations usually negatives tuberculosis and (2) that tuberculosis in the adult practically never begins as a basal lesion.

Surgery is the only help for these cases. Early recognition, followed by quick operative procedure. I firmly believe that our first case would have lived had the diagnosis been made early enough and a radical lobectomy performed. The second case was diagnosed too late for the proper intervention. The third case we hope to report as cured.

A word about influenzal spots: A consolidated area may remain in a lung for months after the initial disease. The symptoms caused are low grade temperature of 99, or 100, some cough and

slight expectoration. There may or may not be loss of weight.

Careful physical examination, particularly of the inter-scapular spaces, will elicit a dull area with impaired breathing, and often fine inspiratory rales. An X-Ray picture such as is here shown will quickly make the diagnosis.

CONCLUSIONS.

1. We must recognize non-tuberculosis as a disease.

2. A large percentage, estimated at 10 to 16% of diagnosed pulmonary tuberculosis is not tuberculosis.

3. Too many of our returning soldiers are being classified as tuberculous when in reality they have perfectly normal lungs.

4. Errors in pulmonary diagnosis can be avoided by careful cultural examination of the sputum and the aid of the X-Ray.

5. The epidemics of 1917 and 1918 will produce a considerable number of lung abscesses whose diagnosis as pulmonary tuberculosis is inexcusable because fatal to the patient.

6. Early recognition and radical surgery are the means of combating acute and sub-acute purulent complications, such as lung abscess or localized gangrene of a lower lobe.

7. Primary tuberculosis in the adult seldom or never begins as a basal lesion.

CASE REPORTS.

Case 1. S. K., aged 19, married, had never been ill until April, 1918, when, following an ether anesthesia, contracted pneumonia. The anesthesia was given for a curettage.

Came under my observation July 28th, 1918, with a diagnosis of pulmonary tuberculosis. Her complaints consisted of pain over the right chest, constant cough, excessive purulent expectoration; vomited all her meals on account of cough.

Examination revealed dullness above left clavicle and over left apex posteriorly; also over right apex and at right base. Auscultation over right upper lobe and at right base showed roughened breathing, accompanied by coarse, dry rales.

A tentative diagnosis of pulmonary tuberculosis was made in this case. At no time, however, although weekly examinations were made, were tubercle bacilli found in the sputum. The left lung being in good condition, artificial pneumo-thorax was attempted on September 26, and 500 CC of nitrogen gas injected into the pleural cavity. October 3, 1918, patient stated that she felt improved and that her cough and expectoration had considerably diminished. On this date 1,000 CC of nitrogen gas were injected into the pleural cavity. October 17th all symptoms returned, patient again raising large quantities of muco-purulent sputum of very foul odor. On October 30th, a large needle was inserted at the right base. Upon withdrawing the barrel of the syringe, no fluid was obtained, but the needle contained a few drops of thick, yellowish-green pus.

The conclusion was arrived at that we were not dealing with a case of tuberculosis at all, but a lung abscess. Patient was advised to go to San Francisco for operation.

At Mt. Zion Hospital, in San Francisco, X-ray photograph showed a dense shadow occuping the entire right lower base.

First operation by Dr. Brunn, December 18th, 1918. Incision into lower lobe right lung; entire lobe hard mass, but no pus discovered. Patient put to bed and drainage applied. After two months patient was still coughing thick, purulent sputum. No pus was drained from wound. General condition worse, with loss of fifteen pounds weight. Second operation was deemed advisable, and performed January 17th, 1919, consisting of lobectomy of lower lobe right lung. Patient died the same afternoon. At this operation abscess found in lower lobe; also abscessed mediastinal gland.

Conclusion from this case: The diagnosis here was unquestionably a lung gangrene, with lung abscess. Had this diagnosis been made early and a lobectomy performed, the life of this patient might have been saved.

Case 2. T. M., aged 35, male, was well until an attack of influenza in October, 1918. Pneumonia accompanied the attack and patient never regained his health and on account of constant cough, loss of weight and copious expectoration, was diagnosed as pulmonary tuberculosis. Came under my observation January 23d, 1919; the physical examination showed an emaciated man, with dullness over the entire right chest posteriorly from the middle of scapula to the base, with decreased vocal fremitus over area of dullness. Ausculation showed roughened breathing over left apex, diminished breath sounds over right base.

February 5th, exploratory thoracenthesis was done at right base and 5 CC of bloody purulent matter was drawn.

February 6th, patient developed hiccoughs which could not be controlled by ordinary means; these hiccoughs lasting thirty-six hours, it was decided to send him to a general hospital for operative intervention.

February 8th, diagnosis of pulmonary abscess was made and patient recommended for operation. This patient's condition was so grave that the operation simply consisted of relieving adhesions of the lung to the diaphragm, which caused cessation of hiccoughs. Patient died one month after operation.

Case 3. R. R., child 10½ years of age. October, 1918, influenza and pneumonia. Ill thirty-three rays. Period of apparent health until January 10, 1919, when she again took ill, with diagnosis of influenza relapse; twelve days in bed. Following this attack, continued to cough thick, purulent sputum. Afternoon temperature up to 100.5 degrees, with days of no fever. She came to me March 15th, 1919, with the statement of her father that two physicians had diagnosed her condition as pulmonary tuberculosis, although no tubercle bacilli had been found in the sputum and the loss of weight was insignificant.

The physical examination showed dullness of the entire left chest, anterior and posterior, with absent breath sounds under clavicle and distant bronchial breathing posteriorly. The vocal fremitus over area of dullness was materially increased.

Laboratory: Sputum negative to tubercle bacilli; some diplococci; no pneumococci. Streptococci present, numerous gram positive and negative bacilli. Culture shows diplo- and streptococci. The blood showed 17,000 leucocytes with 60 per cent. polymorph. The urine was negative.

The **X-Ray:** (See Plate) showed dense shadow of entire lower lobe.

Diagnosis: Pulmonary abscess left lung, upper part of lower lobe.

Operation by Dr. Harold Brunn, March 22d. Fourth rib resected in axillary line and lung incised in the densest area after aspiration had produced small amount of pus.

No free pus was obtained. Patient put to bed with drainage of wound. After one week practically no pus came from the wound, but patient was still coughing and expectorating large amounts of heavy, purulent sputum.

March 29: Returned to operating room; under anesthesia patient coughed, and considerable pus exuded into wound opening. The syringe was inserted and a large abscess found posterior to incision instead of anteriorly toward bifurcation, as was originally supposed. Drainage from wound after this was considerable and uninterrupted.

April 15: Patient is convalescing. Very little pus from wound; cough and other symptoms have almost ceased. Recovery should be complete in this case.

Criticism: In spite of most careful fluoroscopic examination and stereoscopic plates, we were deceived as to the exact location of this abscess.

Case 4. I. A., a child 5 years old, of healthy parents, susceptible to attacks of Acute Bronchitis. Developed influenza five weeks previous to having an X-ray taken. Ran a temperature 104-105, had definite localized lesion right base, still running a temperature at time X-ray was taken. Some cough, no expectoration.

Plate shows exudate or influenzal spot which will disappear under rest.

Case 5. J. F. Long-standing history of cough in coal miner.

X-ray shows marked pneumokoniosis.

Bibliography.

1. Cole, Dochez, Avery—Monograph 1917.
2. J. A. Luetscher—Archives Internal Medicine Oct. 1915.
3. Chandler Walker—American Journal of Medical Science, February and March, 1919. Boston Med. & Surg. Journal, 1918 CLXXIX, 288. Archives Internal Medicine, 1918 XXII, 466. Ibid. 1919.
4. Stone & Swift—A. M. A. Journal. February 15, 1919.
5. Opie, E. L.—A. M. A. Journal. February 22, 1919.
6. Lieutenant Colonel J. H. Elliott—American Review of Tuberculosis. January, 1919.
7. A. Trasoff—New York Medical Journal. October 19, 1918.
8. Fishberg—Textbook Pulmonary Tuberculosis & Medical Record. January 22, 1916.
9. J. A. Miller—American Journal Medical Sciences. December, 1917.
10. Garvin, Lyall & Morita—American Review of Tuberculosis. Vol. 1. No. 1.
11. Garvin, Lyall & Morita—Medical Clinics of North America. July, 1918.
12. J. A. Miller—New York Medical Journal. April 28, 1917.

A REVIEW OF THE PNEUMONIA OF LAST YEAR.*

By ALBERT H. ROWE, M. S., M. D., Oakland, Calif., Assistant in Medicine, University of California Medical School, Oakland, California.

An unprecedented prevalence of pneumonia has occurred during the last year associated with the massing together of men for war purposes and the recent epidemics of influenza, measles, and streptococcal infections. So many articles have been written within the last twelve months dealing with the symptoms and the changes in the routine treatment of these pneumonias and of empyema that it seems proper at this time to review the situation.

The pneumonias, broncho-pneumonias and their complications, which occurred before the great pandemic of influenza evidenced itself, presented some most unusual features and these will be considered in this paper. The influenzal pneumonias will not be discussed since this was thoroughly done in a recent article by Reed in this journal.

Pneumonia became the problem of the Army as soon as the camps were established. Several cantonments had epidemics of hemolytic streptococcal pneumonias of great severity, some of them being associated with measles. Indeed, W. H. Welch stated that the enhanced virulence of the streptococcus was the most important problem of the war. Moreover pneumococci belonging to the formerly less harmful Groups II. and IV., began to show remarkable increase in producing disease. Lobar pneumonia, such as that of civil life, became unusually fatal because of secondary infections with streptococci. Indeed unless so complicated, many observers including Stone, Camac, and Opie feel that lobar pneumonia is relatively harmless. Staphylococcal pneumonia, as described by Chickering and Park, has been rather frequent and very fatal in certain camps.

The mortality in these pneumonias at times has been exceedingly high. Stone quotes the average mortality for lobar pneumonia as being 45 per cent. and for broncho-pneumonia complicating measles as 23 per cent. In some other camps the mortality for broncho-pneumonia has been nearer 50 per cent. A most striking fact has been the varying mortality from month to month, being highest during March and April and least in November. This has been due to the increased virulence of the pneumococci and the frequency of the hemolytic streptococcal infections.

Cummings comments on the marked fatality of hemolytic streptococcic septicaemias. Hirsch found the virulence of pneumococci belonging to Groups II. and IV. unusually severe in Camp Grant. The mortality, moreover, has been raised because of the frequency of empyemas which at first were exceedingly fatal.

The diagnosis of lobar pneumonia has been without difficulty, initiated as it usually is by a chill and high fever. Broncho-pneumonia, however, was often overlooked at first, thus leading to serious consequences because of the patient being up and around. It was to be suspected when the patient became restless and developed cyanosis and dyspncea as the fever persisted. Moist crackling rales developed in one or both lungs with no definite consolidation. The pulse became weak. Drenching sweats were apt to occur. The fever was irregular and finally fell by lysis.

The X-ray has been especially efficient in showing consolidation in the lungs before physical signs develop. These characteristics of the X-ray picture in lobar and broncho-pneumonia have been well described by Davis in a recent article. It would be fortunate if every suspicious pneumonia could be roentgenographed. However, the X-ray can only be made use of for this purpose in modern hospitals or clinics.

Blood counts show a leucocytosis in both broncho and lobar-pneumonias, being slightly higher in the former. Cole, and later Dunham, comment on the rather infrequent positive blood cultures. One of the best series of blood cultures was that of McClelland who obtained 19.3 per cent. positives. Of these 46 per cent. were due to Type I. pneumococcus, 25 per cent. Type II., 4 per cent. Type IV., and 35 per cent. streptococcus hemolyticus. As mentioned before, in other camps, Group II., and especially Group IV., pneumococci far outnumbered Group I. in frequency.

*Read before the Alameda County Medical Society.

The modern method of determining the types of pneumococci and streptococci in the sputum, developed through the work of the Rockefeller Institute under the leadership of Rufus Cole, Rosenow of the Mayo Clinic, and others, has made possible the accurate determination of the organisms causing pneumonia. Of the four recognized types of pneumonia, infections due to the third have been absent in practically every camp. Types II. and IV. have been largely responsible though in some camps, pneumonia due to Type I. has been fairly common. In contrast to this prevalence, it is interesting to compare Cole's findings in 1917 which showed 65 per cent. of lobar pneumonias due to Groups I. and II. with 25 to 35 per cent. mortality, and 10 per cent. due to Group III., these being most severe. Group IV. consisting of the ordinary mouth pneumococci rarely caused pneumonias. It was found that organisms of Groups I. and II. could be carried for a few weeks in normal mouths, whereas Group III. organisms could be carried for years. The streptococcal pneumonias have been due most frequently to the hemolyticus, though the non-hemolytic streptococcus has been responsible at times.

The treatment of pneumonia has been somewhat revolutionized in the last few years, again largely through the work of Cole and his associates. Fresh air has been found most important because of the disturbed respiration. In a very convincing article, Stone shows the much lower mortality among cases which have been thoroughly digitalized. He followed the method of Eggleston in administering digitalis, giving about .15 c.c. of a standard tincture of digitalis for every pound of body weight in graduated doses during the first 48 hours of the treatment, following this by smaller tonic doses. For falling blood-pressure and intestinal atony pituitary extract has been used. Atropin has been useful in pulmonary edema and bronchorrhea. Care must be taken, it has been found, with irritating enemas since thrombosis in the hemorrhoidal veins with resulting pulmonary embolism, may occur. Fluids must be forced if necessary by rectum and intravenously. Litchfield has had encouraging results in desperate pneumonias with 25 per cent. glucose intravenously, though others have been unable to see the same benefit.

The use of serum in pneumonia is of recent development. It is generally conceded in pneumonia due to Type I. that about 100 c.c. of Type I. serum should be given intravenously daily for three or four days. Redden recently recommends only eight-hour intervals between doses. That this treatment is beneficial is shown by the frequent abortions of those pneumonias and by demonstrations, such as that of McClelland, that positive blood cultures disappear after serum treatment. Spooner and Sellards point out the importance of the serum being of high titer. In their Type I. pneumonias where serum of low titer was used, the mortality was 53 per cent. as compared with 7 per cent. where serum of high titer was employed. Polyvalent serum is not recommended by all, though at Camp McArthur cases which received such serum routinely in spite of the type of pneumococcus found, have run a milder course with a lower mortality than where such serum was not used. Camac also recommends such use of polyvalent serum. Reed recently calls attention to the use of blood transfusions from donors convalescent from the same type of pneumonias as that suffered by the patient.

In severe pneumonias due to the streptococcus, anti-streptococcic serum is probably indicated though it must be given in at least 50 c.c. doses. However, Stone states that the maximal good from streptococcic serum will not result until a polyvalent serum, potent for all known strains of pathogenic streptococci, is obtainable.

To prevent serum anaphylaxis all patients should be given 1 c.c. of serum subcutaneously followed in half an hour by 1 c.c. intramuscularly. If no local or general reaction results at the end of one hour the administration of the full dose can be started though the first 15 c.c.s should be given very slowly. If the patient is sensitive, very small doses of serum given over several hours in increasing amounts will desensitize him. If the patient shows signs of sensitiveness to serum after it has been given, he will within twenty minutes become uneasy, begin to scratch his skin, breathe rapidly and become apprehensive and moderately cyanotic. If one milligram of atropin and 1 c.c. of adrenalin are then given intramuscularly on the appearance of these symptoms, they will all disappear within fifteen minutes and serum treatment can be continued within 1 hour.

One of the most serious developments of the past year has been the prevalence of empyemas in pneumonias, particularly those due to the streptococcus. In the latter type, empyemia has come on exceedingly early and in some camps even 36 per cent. of streptococcal pneumonias have been thus complicated.

The diagnosis of these empyemas is most important. Clinically they may be recognized by increased respiratory and pulse rates, by increased cyanosis, and delayed resolution. The temperature may be slight or even absent. On examination of the chest, weak voice sounds, diminished tactile and vocal fremitus and whispered voice sounds, together with flatness are the most important signs in suggesting fluid. Sweating is usually very marked as emphasized by Brooks. A septic appearance is apt to develop.

The X-ray is especially serviceable in locating inter-lobar empyema and in showing fluid in the pleural cavities.

If empyema is suspected at any time, exploration with an aspirating needle about four centimeters long must be repeatedly done until the fluid is obtained. This last procedure is universally recognized as being the most important means in diagnosing empyemas.

In the varying camps the mortality due to empyema has varied. At Camp Meade for instance, empyemas due to pneumococcus showed 40 per cent. mortality, while those due to streptococcus showed 41 per cent. In another camp 23 per cent. of all pneumonias developed empyema, 54 per cent. of which died.

In the empyemas due to streptococcus which have often developed during the first few days of the pneumonia, it has been found that a thin exudate at first forms and that if an operation is done at this time the mortality is exceedingly high. Thus twenty-two of such cases commented on by Brooks due to the streptococcus and operated on early, nearly all died. It is now conceded that such empyemas must be merely aspirated every one to three days according to the embarrassment of respiration until the pus becomes thick and creamy. If necessary a little salt solution can be introduced to dilute the pus and enable it to be withdrawn. Then finally either surgical intervention can be resorted to if it is deemed best to do a costectomy or a thoractomy, or the empyema may be treated by one of the closed methods some of which are briefly mentioned below.

The empyema commission has suggested that a drainage opening from two to four inches in length be established so that a double-barreled drainage tube can be introduced through a rubber dam attached to the skin by adhesive. Suction is established on one tube and in this way the lung can be kept from collapsing. Dakin's solution can be instilled and drawn off from the cavity through the other, thus preventing the persistence of the streptococcic infection. Garbat points out that the empyema should not be considered cured until the cultures from the cavity itself are negative. By this treatment the mortality in empyemas has been reduced from between 30 and 85 per cent. to 4.3 per cent. in Camp Lee. Thoracotomy and this introduction of Carrel tubes is not to be recommended because of the necessity of an open thorax.

McKenna, and in a later article Mozingo, recommend another procedure for the closed drainage of empyemas irrespective of the character of the pus present. A trocar and cannula just large enough to thread a No. 14 French catheter into it, is introduced into the chest, at the most suitable point, as determined by the X-ray. After the catheter has been inserted the cannula is withdrawn. The pus from the cavity is then drained off. The catheter is left in place and there is left in the cavity an amount of Dakin's solution equal to one half the number of c.c.s of pus withdrawn. The drawing off and instillation of this Dakin's solution is repeated five times a day by either an experienced nurse or the surgeon. After seven days the pyogenic membrane is usually dissolved by Dakin's solution. Mozingo then recommends the use of formaldehyde instillation which was found to sterilize cavities which did not become sterile with Dakin's solution. In the presence of other pockets of pus similar to those along the sternal pleura, which have proved so fatal according to Stone, the above procedure is repeated. The advantage of the use of the catheter is that the lung is not damaged, open pneumothorax is not produced, and sinuses are not so apt to follow as when thoracotomy is done.

The use of a Brewer tube with a stiff rubber suction bulb attached has been recommended by Blankenhorn as another closed method for the drainage of empyemas.

The danger of open pneumothorax is pointed out by Graham and Bell in an excellent article based on experimental work. They found a normal person can stand an opening two inches by 4 inches only a short time, since the change in pressure is transmitted through the mobile mediastinum to the opposite lung. Thus in pneumonia where the air passages are obstructed, the respiratory muscles are exhausted, and consolidation is present, the embarrassment of respiration is too great in open pneumothorax and asphyxiation gradually results. However after the acute empyema subsides, consolidation is gone, the respiratory muscles have recovered and the mediastinum is stiffened by adhesions this embarrassment does not result. They moreover point out that lung surgery is grave and chest openings must be closed immediately.

The X-ray has been used to show the extent of old draining empyemic cavities. Thorium nitrate and potassium iodide have been suggested for filling the cavity in order to get the picture, but the best mixture seems to be that of Stevens consisting of a sterile combination of cotton seed oil with 20 per cent. bismuth subnitrate and 3 per cent. powdered acacia.

Finally in the treatment of empyemas the patients must be exceedingly well fed so that the nitrogen waste which is quite excessive can be equalized. The prevention of cicatricial fixation of the lung after the empyema has healed should be prevented by blowing against resistance, by the use of negative pressure, and by physical exercise.

Other complications, such as pericarditis, otitis media, jaundice, mastoiditis, meningitis, interstitial emphysema and pneumothorax, peritonitis, and lung abscess are not especially common as shown by the post mortem examinations by McCallum and others. However, they should be kept in mind and watched for carefully.

Many prophylactic measures have been developed during the last year as a result of the prevalence of these pneumonias. In the Army camps resistance to infections has been definitely lowered by exposure to wet, by insufficient clothing and food, and by exhaustive work. Eradication of these conditions has been attempted. The use of masks by all who treat infectious diseases has become routine in the Army. It is quite evident however, as Maxey emphasizes, that the danger of droplet infection through the eyes is quite as great as through the nose and mouth. Thus for adequate protection large glasses should be worn as well as masks. In the Army, patients have not been allowed to smoke, since germs can be carried in that way. Careful regulation of wash rooms has been insisted upon. The demonstration that healthful people can carry pneumonia producing germs had become definite. Cole has shown the frequency of pathogenic pneumococci in the throats of healthy persons who have been in contact with pneumonic patients, and Ingraham recently has pointed out again the similar finding of streptococci as a result of contact with patients infected with those or-

ganisms. Finally the demonstration of the success of quarantine of all patients until accurate diagnoses are made and the distribution of such patients in wards where like infections are only present has been shown to discourage the spread of such diseases.

As a preventive for pneumonia definite evidence, such as that of Fennel in an excellent recent article, begins to show the success of pneumococcic lipo vaccines in the prevention of pneumonia of all types included in the vaccine. Rosenow moreover is of the same opinion. Camac prophesies good prophylactic results in the use of carefully prepared polyvalent streptococcal vaccines. The failure of former attempts in prophylaxis has probably been due to the non-inclusion of the proper strains of pneumococci and streptococci in the vaccine which has been administered.

In conclusion I wish to lay emphasis on the following facts.

1. Pneumonia of unusual severity and varying mortality has been most prevalent during the last year, especially in the Army camps.

2. The diagnosis of these pneumonias, especially of the lobar type, has been greatly facilitated by the use of the X-Ray.

3. The treatment of these pneumonias with large doses of digitalis and in suitable cases with serum has undoubtedly reduced the mortality.

4. Empyemas developing early in pneumonias due to the streptococcus have been found especially fatal unless repeatedly aspirated until the pus became thick and creamy, when surgical intervention, preferably by a closed method, might be resorted to safely.

5. Many new ideas for successful prophylaxis have been worked out including the use of pneumococcic and possibly streptococcic vaccines.

Thomson Building.

(Note: This communication is a digest of some one hundred articles which have appeared in the medical literature of the past year. A few of the most important references are given.)

References.

1. Stone, Phillips, Biss. A Clinical Study of Pneumonia Based on Eight Hundred and Seventy-one Cases; Arch. Int. Med. 1918, Vol. XXII., p. 409.
2. E. K. Dunham, E. A. Graham. Cases of Empyema at Camp Lee; A. M. A. 1918, Vol. LXXI.; pp. 366 and 443.
3. L. Litchfield. Glucose Intravenously as a Therapeutic Measure; A. M. A. 1918, Vol. 71; p. 504.
4. R. Cole. Prevention of Pneumonia; A. M. A. 1918, Vol. 71; p. 635.
5. H. Brooks and R. Cecil. A study of Eighty Cases of Empyema at Camp Upton; Arch. Int. Med. 1918; Vol. 22; p. 269.
6. L. Spooner, A. Sellands, J. Wyman; Serum Treatment of Type 1 Pneumonia; A. M. A., 1918, Vol. 71, 1310.
7. R. Cole. Suggestions Concerning the Prevention and Cure of Acute Lobar Pneumonia; Amer. Jour. of Pub. Health, 1917, Vol. VII., p. 6.
8. Graham and Bell. Open Pneumothorax; Its Relation to the Treatment of Empyema; A. J. Med. Sc. 1918, Vol. 156; p. 839.
9. E. L. Davis. A Roentgen Study of One Thousand Chests at Camp Devens; A. M. A., 1918, Vol. 70; p. 1525.
10. Maxcy. The Transmission of Infection Through the Eye; A. M. A. 1919; Vol. 72; p. 636.
11. Chickering, Park. Staphylococcus Aureus Pneumonia; A. M A., 1919; Vol. 72; p. 617.
12. Opie. Pneumonia at Camp Funston; A. M. A., 1919, Vol. 72; p. 108.
13. Stone and Swift. Influenza and Influenzal Pneumonia at Fort Riley; A. M. A., 1919, Vol. 72; p. 487.
14. Fennel Prophylactic Inoculation Against Pneumonia; A. M. A., 1918, Vol. 71; p. 2115.
15. Mozingo. The Surgical Treatment of Empyema by a Closed Method; A. M. A., 1919, Vol. 71; p. 2062.
16. Reed and Snure. Pathology and Treatment of Influenzal Pneumonia; Calif. State Jour. of Med., 1919, Vol. XVII., p. 43.
17. H. McKenna. Operation for Empyema; a Preliminary Report Covering an Observation on One Hundred and Fifty-five Cases; A. M. A., 1918, Vol. 71; p. 743.

CYSTITIS AS A DIAGNOSTIC FALLACY.*

By GEORGE G. REINLE, M. D., and E. SPENCE DE PUY, M. D., Oakland.

Nephritis, Cystitis. Of all the recognizable disease pictures of the urinary system these two as diagnoses rank highest in degree of popularity. So almost exclusively are these terms used that one might question whether other urological conditions are sufficiently well kept in mind, and whether in truth the terms cystitis and nephritis have a definite meaning in the minds of their users. More frequently than should be, are disturbances of the urinary system lacking in definite recognition. It is only within quite recent times, however, that urinary diseases have been studied in terms of living subject; heretofore they have been classified in accordance with the findings of the mortuary room, and effort made to fit the symptoms of the living to the findings of the dead.

Urine reports are closely scanned, but are all of the findings given due consideration? The diagnoses reached from the urinary reports are commonly far from ideal. As frequently interpreted, if there are casts, irrespective of reported white blood cells, the case automatically becomes one of nephritis, the type, depending upon the specific gravity and urine output or, if there is pus, and no casts, the case is not uncommonly concluded to be one of cystitis. In all probability neither of these diagnoses is correct, but in regard to the latter we wish particularly to call attention.

That the number of diagnoses of cystitis is too common and is not particularly creditable; a multitude of diagnostic sins hide behind it. Cystitis as a diagnosis is applied to pathological conditions ranging in location from the meatus urinarius to the cortex of the kidney. This is unfortunate when the grave consequences are considered, for while actually priceless time is being whiled away in the consumption of demulcents, the ingestion of urinary antiseptics, the injection of vaccines, and irrigations of the bladder, one and often both kidneys are frequently undergoing degeneration beyond repair.

Cystitis as a diagnosis will not do. We must realize that the term, as indicative of a disease, is of but limited significance. This is a conclusion fully concurred in by all urologists. A diagnosis of cystitis at the best can be but 4 per cent, which leaves small margin of comfort. Cystitis is no more a disease than is "dropsy" or "inflammation of the bowels."

Calk has this to say: "Cystitis as a disease is extremely rare, it is usually representative of some co-existing infection either in the upper urinary

* Read before the Alameda County Medical Society, Oakland, California, March 17, 1919.
Read before the Forty-eighth Annual Meeting of the State Society, Santa Barbara, April, 1919.

tract or in the genitals. This diagnosis, frequently based upon the symptoms: frequency, pain and pus in the urine, is entirely insufficient, and this superficial diagnoses is responsible for many of the destructive kidney lesions." And, he adds: "The profession must realize that if such symptoms do not promptly abate under the standard treatment for cystitis within a week or ten days, the cystitis is complicated by some other disease particularly infections of the kidney."

Another authority asserts: "It is important not to be deluded into being satisfied with dismissing a patient with the diagnosis of cystitis. The symptoms call for a complete investigation of the kidneys, prostate, seminal vesicles and urethra, as well as the bladder itself." Keys says: "The diagnosis of cystitis means nothing. Inflammation of the bladder is ALWAYS caused by something else. That 'something else' is usually infection of the kidney."

Undoubtedly there may be a cystitis in a cystocele, for example, for here we have the ideal conditions of stale urine, decomposition, and irritaton of the mucosa by an alkaline urine, and the clse proximity of this culture medium to a source of infection the genitals and the lower bowel. But even here the dagnosis can not properly be a cystitis, for we have back of it a bladder defect.

We have cystitis following other causes of urinary retention of course, but as they are classifiable as urinary diseases our cystitis again becomes merely a symptom, not a disease. Nor is it of any particular moment what the infecting organism may be, whether it be colon bacillus, staphlococcus or an organism causing incrustation.

The two great factors in cystitis are retained urine, plus invading organisms. The organism may make its way from the urethra, it may descend with the urine from the kidneys, it may pass from the blood stream direct to the bladder, or it may pass through the lymphatics from adjacent organs.

Retained urine, incomplete emptying, result from obstructions of the urethra, which may be occasioned by phimosis, small meatus, stricture, calculus of the urethra, and new growths in urethra.

At first thought this might seem merely a technical enumeration of causes that would not be overlooked in cystitis. But, considering them in their order, we recall a case of phimosis complaining of frequent and painful urination. The patient was an adult of 37. There was a history of "bladder trouble" from as far back as could be recalled. Physicians had been consulted at various times, and the urine had been examined, but the genitals had apparently never been subjected to inspection. There was a long prepuce, almost fibrous in consistence, which was traversed by a narrow channel, through which it required an expulsive effort to force the urine. A circumcision was done and with a few instillations into the bladder the long standing symptoms disappeared. A complete urological examination revealed no other pathology. The case is simple, the point is obvious, but the patient in the meantime suffered for years.

A pin-hole meatus would cause the same result, but would not, of course, be discovered unless the prepuce were retracted and the meatus inspected.

The following case of calculus of the urethra indicates again the necessity for care in little things. A woman was seen suffering acute distress through inability to void her urine. The bladder was immensely distended, the urethra was intensely hyperemic and patulous. Palpation through the vagina revealed a hard foreign body in the urethra, and an attempt to pass a metal catheter established the diagnosis of calculus of the urethra. So large was the stone it formed almost a complete urethral cast. Upon removal of the obstruction and cystoscopy, the bladder was found to harbor no other calculi. The particularly interesting part of this case is the history. The patient had had "bladded trouble" for eleven years. During that time she had suffered continuously from diurnal frequency, though she had only slight night disturbances, rising usually only twice during the night. The patient "worked out" by the day, and her circumstances were not good, but for all of that she had consulted five different physicians. A sample of urine was requested by each, two of them actually sent the urine to a laboratory, and reported that there was considerable pus. The patient was informed that she had "inflammation of the bladder," though one attendant thought there might be some trouble with the kidneys. Eleven years, five physicians, certainly two examinations of the urine, but not one examination of the patient, and a mere attempt to pass a catheter would have cleared up the diagnosis.

New Growths of the Urethra. Papillomata do occur in the male urethra, and with greater frequency than might be supposed, particularly at the margin of the sphinnter, but they are less common than caruncle of the female urethra. An interesting case in point was recently seen through the courtesy of Dr. Jo Hamilton. A woman 67 years of age, upon whom he had operated for caruncle, was suffering from an intense purulent cystitis. As in many such cases the history taught a great deal. She had suffered well-nigh unbearable distress for nearly twenty-five years. For several years past she had intermittently practised self-catheterization which, difficult enough for the male to perform aseptically, is out of the question for the female. There followed a staphylococcic infection. Upon examination the catheter brought away at first almost pure pus, and the bladder was only cleansed after repeated washings, and would not hold enough for cystoscopic examination unless under an anesthetic, nor would the patient tolerate the manipulation of a close-vision instrument, requiring less than one ounce of water. Although this patient had suffered all these years, her caruncle was only recently discovered and removed, and her self-inflicted catheter infection has resulted in a very pitiable condition.

cystitis but of kidney infections as well. Urethral stricture, because of its principal symptom, when occurring in the male, is not commonly

overlooked. In the female, however, urethral obstruction is not so commonly suspected. In this connection Osgood has this to say:

In the female the urethra is often disregarded. Every complaint of painful urination should focus the attention of the investigator upon the urethra as the seat of the origin of this symptom. Abnormally frequent urination points to a disturbance of the sensory nerves in the grasp of the internal sphincter. Among the important causes of stricture of the female urethra he considers the trauma due to parturition to be one well kept in mind. Luys as well as Osgood considers that the female urethra should be much more frequently investigated through the urethroscope, and in this connection there is no question but what with the newer, water-dilating urethral instruments much better and more enlightening pictures are to be observed.

According to the same observer, the subjective symptoms of stricture of the female urethra may not make themselves manifest for a long period; they may develop gradually, and it may be months or years before the patient calls attention to her condition. Bladder infection is an inevitable late result, this frequently complicated by hypertrophy of the detruser and trabiculation.

Inflammation as well as stricture are a not uncommon condition in the female, and frequently are diagnosed as cystitis. Only an instrumental examination will establish the differential diagnosis. It may be observed in passing that urethroscopy is a more difficult procedure than cystoscopy, and that it demands patience, skill and experience.

Next in order of incomplete bladder emptying as the result of obstructions, we have: displacements, prolapse and cystocele, which we must satisfy ourselves with merely mentioning. Also to be borne in mind are extravesical tumors, adhesions, and obstructions of the bladder neck. The latter is of the utmost importance, for the dual reason that it is so common, and so frequently overlooked. Under this class of obstructions come prostatic hypertrophy, prostatic carcinoma, prostatic atrophy. The cystitis due to these causes is not in the main acute, and may be accompanied by retention varying in quantity from a few to several hundred cc.

Prostatic hypertrophy, even when the gland is of enormous size, is commonly undetected, for the reason that it does not come under touch of some inquisitive finger. Nor is digital examination alone always sufficient, even when the gland is large, for it may be that the main portion of the growth is intravesical. On the whole, however, among men who really examine their patients the very large prostate is generally discovered. It is the only moderately large prostate that one has to keep continuously in mind. An individual with such an obstruction and a residual urine of 20 cc., may suddenly develop an exceedingly stubborn cystitis. The prostate may not be very large, and yet may obstruct the urinary flow. Only an instrumental examination will reveal the true condition. It is upon this type of prostate the surgeon hesitates about performing a radical operation; something however must be done, and it is here endoscopic methods of attack are to be preferred.

Prostatic carcinoma, in considering cystitis, may be dismissed with consideration of prostatic hypertrophy, from which it will not be differentiated except by the exercise of special skill.

In addition to the obstructive causes of incomplete emptying there are the spinal lesions. Not uncommonly it is the urologist who discovers the first evidences of tabes. Just as truly as the eye-ground mirrors a nephritis, so the trabeculated bladder may reflect the spinal lesion. Were routine cystoscopies done in all cases of cystitis, the tabes cases thus early detected would at least have a better chance of recovery through intensive spinal therapy administered at a time when the prospects of cure are better than when the symptoms have become more obvious.

As a quite different cause of incomplete emptying, diverticulum of the bladder is to be thought of. It is not a rare condition. The symptoms are frequent urination, pain, pus in the urine,—cystitis. Only the cystoscope will reveal the condition.

These, then, the various causes of incomplete bladder emptying and comprising a considerable number of well-defined conditions, are among the few that are daily treated for cystitis. But this is only one group. Another important group are the chronic irritants.

Foreign bodies.
Calculus.
Neoplasms.

Foreign bodies in the bladder generally bring with them their history of how the "accident" occurred, and consequently furnish their own diagnosis.

Calculi are not always diagnosed. One case is recalled that was treated several months by bladder irrigations. This patient was later operated upon by another attendant with the natural result of relief and cure.

Neoplasms of the bladder, when of long standing, give rise to a particularly intolerable cystitis, once they become infected. The diagnosis of vesical tumor is to be made either through cystoscopic examination, or, if of sufficient size, may be demonstrated by a cystogram, taken with a shadow-casting fluid in the bladder. A case of multiple papilloma came under observation a year and a half ago. This patient was suffering from frequency and pain of so severe a character that she was confined to the house entirely. The growth so completely filled a contracted bladder that cystoscopy with a water medium was out of the question, as not more than 30 cc. of fluid could be introduced. The ordinary observation cystoscope plunged immediately into a mass that darkened the instrument so that observation was impossible. Had a close-vision cystoscope with a continuous flow of water been available a view could of course been had. The mass was palpable through the vagina however and a diagnosis arrived at. The patient was operated by a supra-pubic cystomy, two sessile and one pediculated growth were removed. The history of this case shows that for a number of years this

patient had suffered and been treated by a number of physicians for cystitis. Up to the time this patient was first seen and for a number of weeks previously, the patient had been receiving semi-weekly bladder irrigations, and this in the face of the fact that less than 50 cc. fluid could be introduced. To complete the history, about three months following operation the patient returned with a recurrence of the frequency. The bladder at this time held a 150 cc. of fluid. Cystoscopy disclosed the scars of operation and as well a dozen or more new growths, all of small size, these probably the result of implantation at the time of operation. These growths were fulgurated at intervals of a week. After ten treatments the mucous membrane appeared free of growth in all but one place which had an appearance of malignancy. The patient was quite comfortable however and, although advised to return at intervals for observation, has not been seen for eight months. This is the most interesting case of "cystitis" we have encountered.

Another case of papilloma had three well-defined growths, with frequent urination and tenesmus. Fulguration was followed by relief upon first treatment and complete disappearance after five treatments. The bladder was normal when examined three months later.

So far as life itself is concerned we have thus far not considered the more important causes of cystitis, we now come to the vital factor. If there is pus in the urine it is important to know where it comes from and how dangerous it is.

The sources of pus are:

Fistulae.

Pelvic abscess.

Infections from the lower genito-urinary tract.

Infections of the kidney.

Posterior urethritis, during its onset, almost invariably has as its beginning frequency of urination accompanied invariably by pain. As in all acute cases urethral discharge has so recently advertised the source of the infection, there is small danger of the real condition being mistaken. In chronic posterior urethritis accompanied by vesical symptoms it is a different story. The diagnosis of the precise pathology of the posterior urethra requires special skill, but in order to effect a cure or even relief it is essential that the seat of the trouble and its character should be ascertained. Some of these patients, irrigated for a long time, become utterly discouraged. Although not a menace to life, posterior urethritis is frequently a serious burden to the patient's comfort, and almost invariably a violent disturber of his mental and nervous system. Posterior urethritis is not ordinarily to be cured by the mere passing of a sound, either once or many times, and it should serve better to place general respect for medicine upon a higher plane if this condition were not so frequently treated with little or no regard for refined diagnosis, upon which alone a rational therapy can be based.

Above and beyond all others the most important cause of cystitis is infection of the kidney. It can not be too frequently nor too forcibly repeated that every case of cystitis must at least be suspected of having as its underlying cause an infected kidney, and this suspicion must not be abated until the contrary is proven. If it could be accepted that every case of cystitis must be proved NOT to be of renal origin, if every man could have it brought home to him that he has done but an exceedingly small part of his duty until he has EXCLUDED the kidneys beyond all doubt in every case of cystitis, humanity would be the gainer, and scientific medicine would be advanced.

There is no question but that the seriousness of kidney infections is not sufficiently well understood by the profession at large, and by this it is not meant by men of mediocre attainments only, but men really good in all other branches of medicine, —both surgeons and physicians.

The classifiable conditions about which there is no question, are:

Tuberculous kidney.
Pyelitis.
Pyonephritis.
Pyonephrosis.
Renal calculus with infection.

So important are these subjects that it can not be amiss to state again the well-accepted facts.

Tuberculous kidney, of which it is important to make a diagnosis at the earliest possible time, while surgical means may yet avail, is in a large proportion of cases proclaimed by violent bladder symptoms. These bladder symptoms are, in fact, often the only indications of the disease. "It may be laid down as a safe rule," says Morton, "to suspect tuberculous kidney in *every case* of cystitis in young persons which is not due to stone or stricture and does not get well under bladder washings with solutions of nitrate of silver." To this it might be added that if nitrate of silver solutions aggravate the condition the diagnosis is half made.

Not to enter into the diagnosis, each frequently being the logical successor of the other, is it possible for us to bring home to ourselves too strongly that every kidney disease is not Bright's disease; is it possible for us too strongly to emphasize the fact that pus in the urine probably comes not from the bladder only but very likely has its source in the kidneys; is it possible at all to too strongly urge the fact that the infected kidney goes on from bad to worse!

It might seem that we dwell too long upon the obvious, that these elementary urological truths need no emphasis, but that they do need emphasis we know from daily experience, and we can not too strongly proclaim, even at the risk of censure for our insistence, that there must be a continual, an unceasing watchfulness for kidney infections. If one is not alert a pyelitis will almost while you watch it become worse, and this again turn into something hopeless. There is so little in the way of therapy that can be done for the diseased kidney that it is of first importance that this little be done at the right time.

In a recent report Harry Culver instances 90 cases with proved pyonephritis entering Cook County Hospital in 1917 with not a single diagnosis of the condition, though ten were sufficiently

near to be serviceable to the patient,—that is, pyelitis. Cystitis was the admitting diagnosis range over 19 other diseases, such as appendicitis, cholelithiasis and so forth. This series of cases is reported from a city where the average of ability runs as high as it does anywhere in the country, yet one-ninth of the diagnoses were even approximately correct. The result is not so much one criticism, as for realization that in various affairs we must be dependent upon each other for extra special knowledge, and highly technical skill, if we are to achieve the kind of results properly to be expected of us.

In conclusion we desire to instance a case of renal calculus recently reported in the Journal of the A. M. A. The patient, with pus and blood in the urine, was treated for cystitis and her attendant referred her to a colleague who reports the case. "She was referred to me for diagnosis," says the latter. But instead of having the bladder looked into, or the ureters investigated, to find where the pus and blood came from, or even having a *Roentgram* taken, the consultant apparently made no more intelligent an effort than his predecessors, for he reports trying Argyrol and permanganate irrigations for a considerable time. And then, quite by accident, as it were, "to locate the source of the infection," a *radiogram* was taken and an "enormous calculus discovered and the diagnosis thereby established." But even the diagnosis, with clear indications for surgery did the patient little good, for vaccines were futile because of an incidental purpura hemorrhagica that had developed while the patient was under observation. Only eventually was operation resorted to, with a relief of the intercurrent symptoms, as well as the troublesome bladder for which the patient had sought relief.

Cystitis! Yes, there is such a thing, but it is a diagnostic fallacy, the refuge either of the man who is careless or indifferent.

COMPLETE INVERSION OF THE UTERUS.

By WILLIAM MONROE LEWIS, M. D., Los Angeles.

Mrs. O. A. T., Wt. 130, Age 26, personal history negative, second labor; pregnancy normal in every respect; labor normal and rapid.

While the first labor two years before had been difficult, requiring forceps to complete the delivery, this child was born without any difficulty, the umbilical cord of normal length. The patient was in the dorsal position when the child was born.

The third stage was slow, but not attended by hemorrhage. As the uterus was gathered up in the left hand it was felt to give way and leave the hand. At the same time the placenta protruded from the vagina followed by a large red smooth shining body (the inverted uterus).

There was no hemorrhage. The patient had been given chloroform as labor progressed to ease the pains and when the child was delivered she was completely under its influence. Muscular relaxation seemed complete. Not an instant was lost before efforts were made to restore the organ to its place. In grasping the uterus, which was completely in the world in full view, it felt firmly embedded and as I moved it from side to side there was no give on either side.

I made a cone of my fingers and pressed over the inverted fundus for a point that would give and much to my satisfaction this spot was found before many seconds and the organ returned to its place enveloping my hand. Crede massage promptly restored a firm uterus and the hand was withdrawn with not enough blood to call a hemorrhage. Robust health but no future pregnancies.

The second case occurred in the practice of Dr. J. A. LeDoux, in 1916. It had been a slow tedious labor in a young woman 22 years old, weighing about 120 pounds. This was her first pregnancy and the months of gestation had passed without incident. When dilation was complete forceps were applied and a living child delivered without difficulty, the placenta following promptly without hemorrhage. In a very few minutes the patient recovered consciousness from the ether and at once complained of pain in uterus. Inspection revealed no hemorrhage and nothing protruding. At this moment I was called in consultation. On examination per vagina the vaginal space was occupied by a large smooth shining body very firm, which could be seen on separating the labii: and the hand placed over the pubic brim of the pelvis felt nothing like a uterus. An anesthetic was administered and the uterus restored as in the first case by making a cone of the fingers and feeling about till a soft spot was found, then the uterus was quickly reduced. When the hand was withdrawn from the uterus contraction was prompt without hemorrhage. The patient rapidly recovered from the shock.

The woman has borne one child since without any difficulty.

Both of these cases were spontaneous complete inversions of the uterus as no effort was made to expel placenta or sit up in bed, both being under the influence of an anesthetic. Both cords were of normal length and traction was not made on cord. The second case suffered from profound shock; her condition could not be recognized promptly, as was the first.

Book Reviews

General Medicine. Vol. 1 of the Practical Medicine Series 1919, edited by Frank Billings. 622 pages. Chicago: Year Book Publishers. 1919. Price $2.50.

Contents: Infectious Diseases. Diseases of the chest: bronchi, lungs and pleura, heart and blood vessels. Diseases of the blood and blood-making organs. Diseases of the ductless glands. Disorders of development. Diseases of metabolism. Miscellaneous diseases. Diseases of the kidneys; gastro-intestinal tract. Diseases of the liver and gall-bladder.

Laboratory Methods of the United States Army. Medical War Manual No. 6. Compiled by the Division of Infectious Diseases and Laboratories, Office of the Surgeon General, War Department, Washington, D. C. 256 pages. Philadelphia and New York: Lea & Febiger. 1918. Price $1.50.

This book, although prepared for Army laboratories, should find a wide distribution among medical men engaged in civil practice. The contents deal with: collection and shipment of specimens and materials, solutions and stains, clinical pathological work, quantitative analytical methods, general bacteriological methods, special bacteriological methods, sanitary examination of milk, sanitary examination of water and sewage and detection of mercury in excretions.

The establishment of standard methods among civil hospitals throughout the country would no doubt be of as great advantage as it is in army work. In this small manual, standard laboratory technique only has been considered. E. V. K.

Ultra Violet Rays in Modern Dermatology. By Ralph Bernstein, M. D. 162 pages. Published by Achey & Goerecht, Lancaster, Penn.

This little book is devoted to the effect of light on skin diseases. It is well written, especially clear in technicalities, and for help to one who is using the ultra violet light, it is highly recommended. One always has to read a treatise of this sort with a certain amount of reservation for the author's enthusiasm, otherwise he might reach a conclusion that with the Kromayer lamp and the Alpine sun lamp, his equipment for the treatment of skin diseases is complete, whereas he may find by experience that the use of these instruments is extremely limited, though in their limitation they are most excellent. Therefore, by reading such a treatise and reserving the right to judge, a lot of benefit can be gained.

G. D. C.

The Ungeared Mind. By R. H. Chase. 351 pp. Illustrated. Philadelphia: F. A. Davis Company. 1918. Price $2.75.

This book, as its name must indicate, is not of a strictly scientific character. It represents, perhaps, the leisurely ruminations of a man who has studied his classics and at the same time has found much food for reflection in his every-day work. There is nothing in it to make one consider that it has been compiled for popular consumption, since it is not of the kind that will appeal to the herd. One can easily picture in his mind's eye, a cultured physician of rather broad vision who has felt it incumbent upon himself to write, without any clear direct purpose before him. He has found more pleasure in the production of his pet volume than most of us will derive from reading it. It is a rare man, indeed, who has not felt, at some time in his life, that it would be interesting to let his pen wander over page after page and inscribe the thoughts that play before his mind. How pleasant it is to coin an apt phrase and round out a paragraph with a pertinent quotation. The Ungeared Mind deals chiefly with psychiatry, a subject in which Dr. Chase is well versed. It is written in a pleasant style and gives one the feeling that it has been written by a well-read and interesting man.

M. B. L.

Infection and Resistance. By Hans Zinsser. 585 pp. 2nd ed.; revised. New York: Macmillan. 1918. Price $4.25.

The second edition of Zinsser's well known work appears with omissions and additions in keeping with the most modern conceptions of the subject in hand.

This is true especially of the subject of anaphylaxis—a voluminous literature has been reviewed and the concurrent and conflicting views, based upon his own and contemporary studies, are concisely correllated. The reactions due to nonspecific proteins are given the attention they deserve. A section on immunity in syphilis is a new addition.

Zinsser's work is that of a student and is written for students in immunology. It embraces the principles of infection and immunity without discussing the technical phases of experimental procedure. Its subject matter is probably the most absorbing in all medicine, lucidly and interestingly presented.

E. A. V.

The Disabled Soldier. By Douglas C. McMurtrie. 232 pp. New York: Macmillan 1919. Price $2.

In this time of rehabilitation of every phase of human life, nothing seems so paramount as the rehabilitation of the human being who has become disabled on the battlefield of war, industry, or life in general. Written by an enthusiast, Douglas McMurtrie, who has for the past nine years devoted his time, experience and good will to the cripple, this book is a valuable contribution to American literature. Not only the medical practitioner and the social worker, but every individual interested in the welfare of the disabled, can gather a world of information from this volume. Beginning with a historic review about the "castaway" of society, the author covers all phases of reconstruction of the human wreck in the various countries that have participated in the last war. The question of vocational reeducation and guidance is fully dealt with in reference to men who are handicapped, not only through the loss or deformity of one or more extremity, but who have lost sight or hearing as well.

A. G.

Pathological Technique. A practical Manual for workers in Pathologic Histology and Bacteriology, including directions for the performance of Autopsies and for Clinical Diagnosis by Laboratory Methods. By F. B. Mallory, M. D., Associate Professor of Pathology, Harvard Medical School; and J. B. Wright, M. D., Pathologist to the Massachusetts General Hospital. Seventh edition, revised and enlarged. Octavo of 555 pages, with 181 illustrations. Philadelphia and London: W. B. Saunders Company, 1918. Cloth, $3.75.

The seventh edition of a standard work attests to the good reception accorded its predecessors. Of interest to the histo-pathologist and general laboratory worker are a few additions to the original text. Goodpasture's acid polychrome methylene blue stain for frozen sections and for demonstrating granules in pancreatic cells; Graham's ovidase stain for Leukocytic granules; Bemian's Congo red stain for spirochetes and Claudius' stain for flagella are among the most recently elaborated techniques. The method of differentiating the types of pneumococci as carried out at the Rockefeller Institute is given in detail, but no reference is made to work of other investigators. Among the newer suggestions are the use of the safety-razor blade in section cutting, benzine in paraffin embedding and Rubaschkin's method of fixing celloidin and frozen sections to the slide for staining. The section dealing with the performance of autopsies completes an excellent work.

W. T. C.

The Medical Clinics of North America. Volume II., Number III. (The Philadelphia Number, November, 1918). Octavo of 275 pages with 46 illustrations. Philadelphia and London: W. B. Saunders Company. 1919. Published Bi-Monthly. Price per year: Paper, $10.00; Cloth, $14.00.

Alfred Stengel: Influenza Epidemics of 1889 and 1918. H. R. M. Landis: Influenza and Some of Its Complications. J. B. Deaver: Surgical Complications and Sequelae of Influenza. R. C. Rosenberger: Bacteriologic Study of Sputum in the Recent Epidemic. C. W. Burr: Mental Complications and Sequelae of Influenza. E. A. Case: Bacteriology of Influenza. J. L. Davis: Nose, Throat and Ear Affections Complicating or Following Influenza. Maurice Ostheimer: Influenza in Children. Thos McCrae: Sciatica. J. F. Schamberg and Albert Strickler: Intraspinal therapy in Syphilis. E. H. Funk: Chylothorax; Aortic Aneurysm with Esophageal Rupture; Tuberculosis and Pregnancy. M. E. Rehfuss: Medical Treatment of Biliary Affections. I. P. Crozer Griffith: Dilatation of Colon in Children, with Especial Reference to Idiopathic Form. Maurice Ostheimer: Feeding Babies During Their Second Year. C. S. Potts: Cerebral Palsies of Children. Leon Jonas: Diabetes. D. R. Bowen: X-Ray Diagnosis of Lung Diseases. S. D. W. Lundlum: Physiologic Psychiatry. David Riesman: Influenza, Remarks Upon Symptoms, Prevention, and Treatment.

A Manual of Diseases of the Nose, Throat and Ear. By E. B. Gleason, M. D., Professor of Otology in the Medico-Chirurgical College Graduate School, University of Pennsylvania. Fourth Edition, thoroughly revised. 12mo of 616 pages, 212 illustrations. Philadelphia and London: W. B. Saunders Company, 1918. Cloth, $3.00 net.

No book in the English language fills the place of this excellent guide both for the general practitioner and the specialist. Only a man who is thoroughly familiar with the fundamental principles of the theory and practice of the specialty could gather together in such a short space the essential and leave out the non-essentials as skillfully as has this author. It is a rare pleasure to find in the medical literature the happy combination of authority and literary style which is here exhibited and one is repeatedly startled and pleased with the ease with which the author casts into oblivion the tediously described though non-essential hobbies and half-baked experiments of the glory seeker. Sanity and caution with advanced principles are the key-note of the work, and if every general practitioner would have the book at hand and use it the patient would have far less cause for complaint than he has at present, and the specialist would see fewer phantoms and more realities. H. B. G.

Orthopaedic Surgery. By Royal Whitman. 914 pages; illustrated; 6th ed. rev. Philadelphia and New York: Lea & Febiger. 1919. Price $7.00.

In this new edition, Whitman presents us with an uncommonly well worked out text-book of orthopedics. The classical orthopedic ailments, tubercular diseases of the joints, scoliosis, deformities of the foot, etc., are treated in detail. Those which orthopedics has more recently claimed as its own, various arthritides and traumatic affections, and the rarer disorders are handled more briefly. Whitman's own methods of treatment,—his foot braces, astragalectomy etc., are discussed minutely, but not to the exclusion of others. His judgment and criticism of certain extravagant methods—Abbott's work on scoliosis and Calot's statements, for example, are sane and sound. The book contains good statistical tables and references so well chosen that even the briefer chapters are easy guides to further study. It bears the same relation to orthopedics that Stimson does to fractures—its steadiness and reliability will make it a well-thumbed manual.

On Whitman has fallen the mantle of the old New York Guard of orthopedists—the lineage of Sayre, Taylor and Gibney. He, less than the rest of his American colleagues, has been caught by the widening flood of innovation arising from the war and oversweeping orthopedics. And accordingly the one lack in the book is the small stress laid on traumatic affections. One feels that Whitman has not been in and of this recent work—the work that has made of orthopedics the dominant specialty in industrial traumatic surgery. One feels that what he writes has not been gathered first hand; the chapters on traumatic disorders lack the sureness and independence of the older parts of the book. Information on those things must be sought elsewhere—from the references given in the foot-notes. With this exception, the book is thoroughly good; certainly, as it stands, it may be recommended as the standard American text. L. E.

Surgical Treatment. A Practical Treatise on the Therapy of Surgical Diseases for the use of Practitioners and Students of Surgery. By James Peter Warbasse, M. D., formerly Attending Surgeon to the Methodist Episcopal Hospital, Brooklyn, New York. In three large octavo volumes, and separate Desk Index Volume. Philadelphia and London: W. B. Saunders Company. -918-19. Per set (Three Volumes and the Index Volume): Cloth $30.00 per set.

The reviewer predicts that this work will become immensely popular with both surgeons and students of surgery. The scope of the first volume covers the general principles of surgery, surgical technic, the surgical affections, the surgical diseases of blood vessels, lymphatics, bones, muscles, fasciae, tendons, bursae, the skin and its appendages and nerves. The second volume takes up the special surgical treatment of the head, spine, neck, thorax, breast and abdomen. Volume three covers abdominal surgery, genito-urinary surgery, surgery of the extremities, plastic and cosmetic surgery, electricity in surgery, first aid and bandaging.

Adequately to tell in detail of the subject matter of these three volumes would require an abstract of the books. Suffice it to say, that in them one finds and recognizes almost every point of interest that has appeared in the surgical literature for years past. This refers especially to the journals. A generous number of excellent illustrations constitutes one of the very valuable features of the work. One finds here a beautiful exposition of the application of surgical judgment. The work is not a catalogue of operations nor a manual of operative surgery; it is more a guide in the selection and application of the proper surgical measures to meet the needs of the cases. It will be found a most helpful and oft used addition to the surgeon's working library. G. H. T.

The Surgical Clinics of Chicago. Volume 3, Number 2 (April 1919). Octavo of 242 pages, 62 illustrations. Philadelphia and London: W. B. Saunders Company. 1919. Published bi-monthly. Price per year, paper, $10.00; cloth, $14.00.

Quarterly Medical Clinics. A series of consecutive clinical demonstrations and lectures. By Frank Smithies, Augustana Hospital, Chicago. 188 pages. Published by Medicine and Surgery Publishing Co., St. Louis. Annual subscription: $5 in paper; $8 in cloth.

Contents: Rectal and sigmoid diverticula. Diffuse acute cerebro-spinal meningitis. Enlarged thymus in rachitic infant. Chronic anemia. Chronic intermittent anemia. Intestinal tuberculosis. Complete esophageal obstruction at cardia. Chronic constipation. Gastric cancer. Chronic alcoholism, lues and cardiorenal embarrassment. Cardiospasm and extensive dilatation of esophagus, dysphagia. Tuberculous ulcers of tongue and anus. Fatal case of influenza. Influenza with heart leakage. Chronic gastric ulcer.

We have given the table of contents of this journal according to the diagnosis of cases presented, rather than listing them according to table of contents as given in the journal itself. The cases are well presented and each case is followed by a commentary on various laboratory and diagnosis methods which make it of particular value to small hospital groups and medical societies. The classification of cases by diagnosis, either in a table of contents or in an index would enhance the value of the journal for purposes of reference.

Surgery of Oral Diseases and Malformations, Their Diagnosis and Treatment. By George Van Ingen Brown. 3d Edition. Illustrated. pp. 734. Phila. & N. Y.: Lea & Febiger. 1918. Price $7.00.

This book marks the recent evolution of dentistry from a highly skilled handicraft to an established special branch of medicine. It treats with unusual completeness the bearing of the most

varied disorders—infectious diseases, diseases of nutrition and metabolism and nervous diseases, on dentistry. Objection might be made from the viewpoint of a medical man that comparatively little space is given to purely dental topics, and too much to subjects whose bearing on dentistry is scarcely apparent. We should wish especially for a fuller discussion of focal infections of oral origin which are disposed of in a scanty eight pages. From the standpoint of the dentist and the dental student, however, for whom the book is primarily intended, these objections will not hold. The dental specialist can get his detail from other sources, and it is a pleasure to see so well grounded and broadly planned a work issue from the ranks of the dental profession. The book contains good descriptions of dental pathology, many of which will be of interest to the internist and general surgeon, e. g. the descriptions of changes in the tooth-pulp in trigeminal neuralgia, alveolar abscess, etc. It is excellently illustrated with photographs, drawings and colored plates. A chapter on dental war surgery with numerous illustrations of plastic facial reconstruction has been added to this edition. The work may be recommended to dentists and dental students; it also contains considerable of interest to the medical man. L. E.

Fractures. By Joseph A. Blake. 150 pp. Illustrated. New York: Appleton. 1919.

In this monograph on gunshot fractures of the extremities, Blake has formulated the results of an experience and observation extending over a period of the war in hospitals largely devoted to fractures. It gives in explicit detail and masterly concision theory and practice of the physiological traction methods of fracture treatment. Those who have followed the development of fracture surgery during these last five years will appreciate the work and study of which Blake's book is the outcome. It will stand as a beautiful monument to five of the best years of the life of one of our chief American surgeons.

L. E.

Essentials of Surgery. By A. L. McDonald. 264 pp. Illustrated. Philadelphia: Lippincott. 1919.

This book would have been better written by a nurse than by a doctor. It tries to give in a compass of 220 pages an oversight over the principal surgical diseases. It includes, however, but little that is of importance and considerable that is not. It gives more space to anatomy, to a fragmentary and not always accurate discussion of pathology and to laboratory findings than to clinical signs and bedside pictures. It does not go into particulars of nursing at all; its directions for treatment are marred by the repetition of such vague phrases as "careful after-treatment is necessary." It can scarcely be recommended to either nurse or doctor.

L. E.

Surgical Clinics of Chicago. April, 1919. Volume 3, number 2. Octavo of 479 pages. 63 illustrations. Published bi-monthly. Philadelphia and London: W. B. Saunders Company. 1919. Price $10.00.

E. W. Andrews: Cholecystectomy and management of proximal stump of cystic duct; Use of kangaroo tendon and spun threads of tendon as substitutes for catgut; Multiple drilling of fractures. A. J. Ochsner: Fracture humerus; ununited fracture humerus; fracture of patella; double harelip and cleft palate. T. W. Brophy: Harelip. Carl Beck: Multiple papillomata of bladder; Syphilis of stomach; Restoration of cheek following extensive resection for carcinoma. C. B. Davis: Plastic repair deltoid muscle; Recurrent dislocation patella. T. J. Watkins: Plastic operation for constriction at vaginal orifice and for vaginismus; Carcinoma of cervix treated by radium and hysterectomy. A. D. Bevan: Appendicitis; Appendical abscess; Carcinoma of cecum; Amputation at middle of thigh for gas gangrene; Abscess of lung; Congenital pyloric stenosis; Carcinoma of larynx. F. B. McCarty: Fracture carpal scaphoid. V. L. Schrager: Suggestion in technic of radical operation for carcinoma of breast; Routine appendectomy through right indirect inguinal hernial sac in afebrile cases; Syphilis of liver simulating gall-bladder pathology. B. F. Davis: Winged scapula. Wm. Hessert: Ununited fracture of neck of femur. E. L. Moorhead: Prolapse of uterus in virgin eighteen years old; Congenital inguinal hernia; Strangulated inguinal hernia complicated by acute gangrenous appendicitis; Infantilism. G. L. McWhorter: Diagnosis of fistula in ano. D. N. Eisendrath: Fractures of patella. Dr. Gatewood: Strangulated epigastric hernia. E. A. Printy: Postoperative diphtheric infection of hernia wound. R. H. Herbst: Severe hematuria; Prostatectomy for hypertrophy of prostate gland; Extensive stricture of urethra; Bilateral colon pyelitis with cystitis; Vasotomy in persistent seminal vesiculitis.

Clinical Microscopy and Chemistry. By F. A. McJunkin, M. D., Professor of Pathology in the Marquette University School of Medicine; formerly an Assistant in the Pathological Laboratory of the Boston City Hospital. Octavo volume of 470 pages with 131 illustrations. Philadelphia and London: W. B. Saunders Company. 1919. Cloth $3.50.

McJunkin is a new writer in laboratory procedure and, from the standpoint of "new blood" in this field, is welcome. The book though, contains but little not found in other textbooks on the subject and as a result has little excuse for being. The chapter on the blood shows some individuality. There is a notable desire on the part of the author to keep the underlying biochemical changes and the blood findings in proper relationship. McJunkin's modification of the Rominowsky stain is given preference over others. Substantial evidence is brought forth to establish the entity of the endothelial leucocyte, including with this group those cells known as transitional and large mononuclear cells. The usual serologic tests are given including a fractional Wassermann test which lacks the more recent technical improvement. Blood chemistry is included.

Chapters on urine and bacteriology of exudates and gastric contents contain nothing new and many valuable tests are omitted. Under feces the various parasites are catalogued but not a line is written on technical matters. The autopsy work contains a few good suggestions pertaining to the handling of tissues and organs. E. A. V.

Immunity

STOP THE JOURNAL.

To the Editor:

I am convinced that not one doctor in ten in California reads the State Medical Journal. If they did there would be more evidence of it in the correspondence column, and various policies and statements in the Journal would not go unchallenged in the local medical societies. Why not, then, stop publication of the Journal? The few papers in it of real scientific merit would appear elsewhere. The money now invested in the Journal would be saved for combating Eddyism and other quack cults, and for advancing the real interests of the doctors.

Yours for the best,

R. A. C.

Los Angeles, May 6, 1919.

REFERRED TO THE "BORED" MEDICAL EXAMINERS.

June 10, 1919.

To the Editor:

Why waste so much space on questions asked by the Board of Examiners? The seven columns in your May issue might have been used to better purpose. These questions may be of interest to future licentiates, but without appending the correct answers they do not educate your old, long since licensed reader. Nor do we get any gauge of our new licentiates—i. e., those who passed the exes—unless we know what answers "got by." And why do we not hear of oral and practical examinations and tests? The Board itself could have stenographers at these seances, and thus insure permanent records for the Board.

Yours very truly,
ONE OF THE BORED.

Los Angeles.

County Societies

ALAMEDA COUNTY.

Personal Reminiscences in England and Scotland during the year 1918 by Lieutenant-Commander Stanley Stillman, U. S. N. R. F., Director Navy Hospital No. 2 (Stanford Unit), was the subject of a most interesting and instructive talk at the regular May meeting of the Alameda County Medical Association. The speaker also showed a number of fine photographs taken during his service. Those who failed to hear Dr. Stillman missed a genuine treat.

Dr. Daniel Crosby gave a brief report of the Santa Barbara meeting. The Doctor felt that the meeting was one of the most inspiring that he had ever attended. Many men came to the meeting who had not been in the habit of coming to others and many well known faces were welcomed from abroad where they had gone to uphold the traditions of the profession.

The sections were well attended and while the papers were all instructive and interesting, some were exceedingly so. The Doctor thought that perhaps the most notable thing in connection with the entire meeting was the luncheon given by the League for the Conservation of Public Health.

Dr. Crosby said that among other things emphasized was the fact, that in his service to the sick man the doctor fails largely to enter into non-medical service to the community and up to this time has failed almost absolutely to obtain a proper community perspective with reference to the medical profession. The great lesson that every practitioner of medicine could have taken and should take from the meeting at Santa Barbara is that in addition to the active interest in the individual he must achieve to a wider community perspective in all things and especially is this true in connection with the affairs of, the standards of, and the very life details of the medical profession itself. Those of us who were so fortunate as to attend the last session of the California State Medical Society were fortunate indeed in having pointed out to us our place as citizens and as members of the greatest of all of the learned professions.

Mr. J. J. Donovan spoke of the objects of the Eye Strain Prevention School Desk and Seat—illustrating the same with lantern slides.

Dr. R. T. Stratton presented a case of surgical closure of a frontal fracture defect by the heteroplastic method and the use of a perforated plate of fine silver with peripheral flanges. The injury was received fourteen years ago. For the last five years the patient has complained of head heaviness, vertigo and headache. For two years general convulsions were added. In the ten weeks succeeding the operation, there have been no unfavorable symptoms.

After the program a buffet luncheon was served.

The May meeting of the Samuel Merritt Hospital Staff Council was unusually interesting. Dr. A. Galbraith discussed "Symptoms of Nasal Pathology," with demonstration of transillumination of the accessory nasal sinuses, and Dr. William Fitch Cheney of Leland Stanford University read a paper on "Peptic Ulcer: Its Differential Diagnosis."

Prof. Samuel J. Hume of the Department of English in the University of California discussed the importance of the Drama and the Theater in Education and gave interesting results that had been obtained in the public schools throughout the State.

At the June meeting Dr. C. L. McVey read a paper on Splenomegaly and Dr. S. H. Buteau discussed Drainage versus Removal of the Gall-Bladder. This subject elicited a spirited discussion among the surgeons present.

Publicity was the subject of Mr. Celestine J. Sullivan's address. After these meetings refreshments are served and a social hour is enjoyed.

Oakland's new Hospital to be erected by The Oakland Hospital Corporation, a corporation composed of professional and business men, is now an assured fact. This hospital is to be fire-proof, modern and absolutely up-to-date, and controlled by a Board of Directors elected by the stockholders, but the strictly medical interests will be handled by an Advisory Board elected by the medical and scientific members of the company. A building site has been acquired and the building plans are well under way.

Lieutenant-Colonel Alvin Powell received his discharge from the Army in New York and will return to California after attending the meeting of the American Medical Association.

Dr. J. N. Force has received the appointment of Associate-Professor of Epidemiology at the University of California.

Dr. Ruby Cunningham of Berkeley has just returned from the East where she was a delegate to the Y. W. C. A. meeting.

Dr. Edward von Adelung of Oakland is among those attending the meeting of the American Medical Association.

The Berkeley Dispensary is opening a Dental Clinic which will be equipped and maintained by the Junior American Red Cross. Through the efforts of Dr. R. T. Legge the Dispensary is also hoping to open a Clinic three nights a week for Venereal Diseases.

The following men have recently been appointed on the Visiting Staff of the Alameda County Hospital: Dr. W. H. Strietmann, Dr. F. M. Loomis, Dr. Chas. Miller, Dr. H. G. Thomas, Dr. H. G. MacLean, Dr. J. W. Calkins, Dr. Dexter N. Richards, Dr. T. J. Clark, Dr. F. H. Bowles, Dr. E. S. DePuy, Dr. E. N. Ewer, Dr. W. A. Woods, Dr. C. A. DePuy, Dr. T. C. McCleave.

LOS ANGELES COUNTY.

The Los Angeles County Medical Association met May 1 at 8.15 p. m. in the Arrow Theatre of the Hamburger Building.

The President, W. T. McArthur was in Sacramento to help prevent passage of Assembly Bill 933. Doctors Beckett, Moore, MacGowan, and others accompanied him for the same purpose. Dr. George L. Cole presided.

Major Ansel G. Cook of Hartford, Conn., spoke on the "Problems of Orthopedic Surgery."

Dr. Cook spoke in a humorous vein, that orthopedic surgery is the broadest speciality; in fact it is so broad that it is not a specialty, and the orthopedist is considered an unmitigated nuisance who butts into every specialty. The orthopedic surgeon is the descendant of the bone setter of yesterday and is tolerated. The old-fashioned bone

setter did things the community wanted done. He will exist as long as members of the profession do not do what the public wants. The laity determines it. If an ankle drags, whether it is due to cerebral paralysis, syphilis, a Pott's fracture, or such like, the orthopedist has to know all of these different things. The orthopedist must be a mechanic. The idea is a balance of bone and muscle. To fit shoes, he has to see the patient as a whole. In balance Dr. Lovett of Boston looked for the center of gravity. It pulls all the time. A body acts statically as if a center of gravity; a pyramid on its apex would be insecure. A dancer has the center of gravity over the base. Wolff's law operates when any part of the body is held in an unnatural position, the bone alters its structure for the new position. Nature tends to cure a certain amount of deformity.

Bow legs can be corrected as the bones are soft. Knock-knees legs are not strong enough to hold the body. Up to four years old the patients can be cured with braces. After seven years the bones become hard. The braces must be worn from six to ten months. Be prepared to put on a mechanical appliance. This will be done until surgeons use splints. Knock-knee requires brace, shank or broad heel and arch inside to change the balance by throwing the weight to the outer side. Raise the inner side of the shoes. There is flat foot when the posterior arch falls down. The bones are held by ligaments and moved by muscles in the calf of the leg. When the ligaments become elongated, the foot drops. If a plate is put higher than arch, you will cause atrophy. Women say they cannot wear low heeled shoes. When the shoe is too short the arch cannot fall down.

The anterior arch falls down in case of callosities. Morton's toe is when the fourth bone pinches the nerve of the fourth toe. It slips out four and five times a day. Put pad under the bone, if uncomfortable use a felt pad to hold up the anterior heel, and thus remove pressure from ball of foot. The balanced position will relieve pain.

Dr. Clarence G. Toland had for his subject, "Service in General Hospital, U. S. Army." He praised the regular army officers who taught the volunteers discipline, etc. The latter were soon convinced that the regulars were superior in knowledge. He spoke of the U. S. General Hospital of modern methods, team work, equipment, etc.

Dr. Albert Soiland on "The Lay Radiographer" defined how the work of laymen differed from that of the professional roentgenologists. Dr. Bowman in discussing Dr. Soiland's paper, said that the secret of success is in the interpretation. Internists know how hard it is to interpret and cannot expect a layman to do so. These laymen cannot exist if physicians stopped supporting them. Send for the roentgenologist.

A vote of thanks to Major A. G. Cook was moved by Dr. Richardson and unanimously carried. There was no meeting May 15 because the Southern California Medical Society had its program May 14 and 15 in Riverside, which many of the Los Angeles County Medical Association attended.

Eye and Ear Section.

Regular meeting May 5, at 8 p. m. Place: Dr. Kelsey's office, 1005 Brockman Building.

Program.

"Symposium on Eye Injuries." Drs. F. W. Miller, T. J. McCoy and W. H. Dudley.

Harbor Branch.

Regular meeting April 25. Dinner at 6.30; program at 8.00. Place: Dining-room of "Puss 'n Boots," 140 Pine avenue.

Program.

"Observations of Influenza at Camp Logan," Dr. E. R. Harvey.

"Control of Venereal Diseases," Dr. A. W. Buell.

"Contagious Disease" (Meningitis), Dr. H. J. Pruett.

"Treatment of Pneumonia," Dr. R. W. Wilcox.

Discussion opened by Dr. F. D. Sweet. Returning members of the Medical Reserve Corps special guests.

Los Angeles Obstetrical Society

Officers—President, P. O. Smith; Vice-President, E. M. Pallette; Councillor, Lyle G. McNeile; Secretary-Treasurer, Lyle G. McNeile.

Last regular meeting of the year—Time: Tuesday, May 13, at 8.15 p. m. Place: Office of Vice-President, 1501 S. Figueroa St.

Program.

Demonstration of a Combination Instrument Sterilizer and Douch Can, Neal N. Wood.

"Arm Extraction in Breech," Lyman E. Thayer.

"The Los Angeles Maternity Service, A Municipal Dispensary," Lyle G. McNeile.

Anesthetists.

On the evening of May 6, 1919, there was formed an organization to be known as the Southern California Society of Anesthetists, of which Dr. F. D. Bullard was elected president. All physicians interested in anesthetics, who are members in good standing of their County Medical Society, are eligible to membership.

Base Hospital Unit is Home.

Members of the Base Hospital Unit, No. 35, has entrained for Camp Kearny, where the 103 men and three officers will be mustered out. The unit is in command of Captain Eliot Alden, of Los Angeles, and the other officers are Lieut. H. A. A. Payette, of Los Angeles and Lieut. H. A. Lille of South Pasadena.

The unit which is composed entirely of Southern California men, most of them from Los Angeles, was organized and outfitted here by the Los Angeles Chapter, American Red Cross, and left Camp Kearny for France, July 4 last, 200 strong, including 100 young women nurses recruited by the Good Samaritan Hospital. By August 10 the unit was established in its own 1000-bed hospital at Mars-Sur-Allier, France, where, in all, ten hospital units were located to care for the wounded and sick. From the time the unit established its hospital until it entrained for home, Capt. Alden stated, that it handled more than 7000 cases. In October, during the height of the Argonne fighting, the hospital handled at one time more than 2800 cases, though the capacity was established at 1000. Later during the influenza epidemic which struck the army, the members of the unit worked night and day.

The Women's Auxiliary of Base Hospital Unit No. 35 gave an entertainment and dance at the Armory in honor of the members of the unit. There were about 300 persons in attendance including 100 members of the unit. A program of music was given and Mrs. Walter Chase, president of the Auxiliary, welcomed the returning men. Homemade pies, cakes, and punch were served.

Makes Them Hygienic.

While he was in the East, Dr. J. L. Pomeroy, County Health Officer, got an idea. This idea has crystallized into what is now known as industrial hygiene. It means educating foreign help to become good, clean American citizens. Recently Dr. Margaret Farr, deputy county health officer, held a meeting in one of the cottages in Simon's brick-yards. The cottage has been given over to the county for this purpose, and is a headquarters. There are 51 Mexican families employed in the brick-yard and Dr. Farr, by the system, is teaching these Mexicans hygiene and efficiency. The work will be carried into other big corporations which have offered every facility.

Units May Wear Decorations.

Sanitary sections Nos. 539 and 625 were added

to the United States Army units authorized to wear the fourragere of the French Croix de Guerre and Sanitary Section No. 646 to those which may wear the fourragere of the French Medaille Militaire.

Druggists' Display.

Great interest in California drug circles is centering in the drug show to be held in connection with the thirteenth annual convention of the Pharmaceutical Association in this city next Tuesday, Wednesday and Thursday. Hall A in the Exposition Auditorium has been reserved for the exhibits which are expected to embrace nearly every product in the drug trade world, as well as sundries.

Alhambra Hospital.

Contract has been awarded for the erection of a hospital on the corner of Bay State and Commonwealth streets. The building when completed will be one of the most modern and complete hospitals in Southern California, and is being erected by the Alhambra Hospital Association, with Dr. C. B. Alexander at the head. It is estimated that the building will cost from $20,000 to $25,000.

Personals.

Dr. Ralph Hagan enlisted in the Army at the outbreak of the war and was immediately assigned to Camp Kearny, where he became acting chief surgeon of the base hospital, serving in that capacity until October 1918, when he was commissioned as chief surgeon of unit No. 96 for service in France. He saw active service with the American troops at the front for a number of weeks before the signing of the armistice. Dr. Hagan served terms as police surgeon of this city and did much pioneer surgical work, being, it is said, the first surgeon in California to use with successful results the now celebrated Murphy button.

In recognition of his patriotic labors in this city during the late war with Germany, Dr. Ralph L. Taylor, city health officer, who was breveted a Captain upon his discharge from the Army, after the Spanish-American War, received from Washington a commission of Major in the Medical Reserve Corps. Major Taylor was appointed health officer by James R. Williams, Commissioner of Public Safety.

Dr. Joseph D. Condit, a well known Pasadena surgeon, who was a Major in the United States Medical Corps in the war and who returned from France three months ago, was seriously injured this afternoon, when he was thrown from his horse. His right thigh was broken. Dr. Condit was riding on Yosemite Drive near the Arroyo Seco. His horse stepped into a gopher hole, throwing Dr. Condit to the ground. He is now a patient at the Pasadena Hospital.

Dr. John Y. Oldham, who served with the rank of Captain in the Medical Corps at Camp Kearny, has returned to Los Angeles and resumed practice.

Lieut. Edward R. Brainerd, Jr., son of Dr. Edward R. Brainerd, left an estate of $100,000 according to a will filed for probate yesterday. He died on February 16 at Camp Zachary Taylor, Ky., while in military service. In the will which is holographic, he leaves his entire estate to his mother.

Capt. A. T. Newcomb, U. S. A. Medical Reserve Corps, in Pasadena, has just returned to his home and practice after nine months in army service. Capt. Newcomb was the chief of the medical service at Camp Kearny Base Hospital. "It is planned to have Camp Kearny as the post for the fourth division of the Regular Army, to be organized at once," said Capt. Newcomb. "The Base Hospital at Camp Kearny cost more than $2,000,000 and comprises about sixty buildings. It is situated about two and one-half miles from Camp Kearny proper. The medical and surgical departments comprise twenty buildings each. The hospital has been receiving an average of three trains a week of convalescent and ailing soldiers, and the work will continue for many months to come. The spirit of the convalescents is wonderful, and in return the War Department is giving the boys the best of care and performing extraordinary work in 'reconstruction' and re-education of disabled men. At the Base Hospital a man is taught any trade or profession he chooses and which his disability enables him to take up."

Lieut.-Col. Frank C. Wiser, who left here with the One Hundred and Fifty-seventh Field Hospital, has been placed in charge of the Children's Welfare Commission of the American Relief Association in Rumania, according to a letter received from the Colonel by Mrs. Wiser. The Children's Welfare Commission is an instituton started by the Queen of Rumania and taken over by the American Relief Association, and, in his letter, the Colonel says his duties are to get the commission running smoothly. The One Hundred and Fifty-seventh Field Hospital Unit has been ordered home and, it is believed, is now on the seas. Lieut-Col. Wiser is well known in this city, where he has practiced medicine for many years. He joined the army several months ago and has seen considerable service in France. He is now in Paris.

REPORT OF A CASE OF LETHARGIC ENCEPHALITIS.

NANNIE C. DUNSMOOR, M. D., Los Angeles.

E. G. (colored), aet. 11, had a severe attack of influenza, December 15, 1918, to January 1, 1919. He was apparently well until February 1, 1919, when he began to be drowsy. He complained of "not feeling well," and had some frontal headache and diplopia. His teacher took his temperature, which was 101 2/5°. She sent him home. He began to sleep more each day until February 15, when he was in a profound stupor. He could be aroused to take very small quantities of milk or water. Urine became scant, as low as 6 ounces in 24 hours. He was very constipated. Temperature and pulse were normal most of the time, then became subnormal.

February 20—Pulse was 30, temperature 97; extremities were cold. There was some stiffening of muscles of neck, back and legs. Pupils were even, responded to light. He would remain in the position placed, nothing aroused him; he did not move when being cared for. Urinalysis showed Sp. gravity 1030; no albumin, no casts. When he began to recover, speech was very slow and he seemed slow of comprehension. He was in that stuporous condition about 12 days, but gradually regained his normal condition. March 15 he was apparently well. Dr. Ross Moore discussed the case, saying he had had six cases with third nerve involvement, but the stupor was not so profound.

SAN FRANCISCO COUNTY.

Society Meetings.

Proceedings of the San Francisco County Medical Society.

During the month of May, 1919, the following meetings were held:

Tuesday, May 6th—Section on Medicine.

Children's Hospital Clinical Evening.

1. Diagnosis and treatment of epidemic meningitis. E. C. Fleischner.

2. Case presentation: Drainage of an empyema through an abscess cavity in lung. R. L. Ash.

3. Activities of the San Francisco Association for the Study and Prevention of Tuberculosis. M. W. Cain.

4. Presentation of an unusual case of anemia. F. M. Holsclaw.

5. Retrospect of 14 years' experience in pyloric stenosis of infants. Langley Porter.

Tuesday, May 13th—General Meeting.

1. Bactericidal and therapeutic actions of chaulmoogra oil in leprosy and tuberculosis. E. L. Walker.
2. Aviation medicine—illustrated by War Department films. Henry Horn.

Tuesday, May 20th—Section on Surgery.

The Surgical Section held its meeting at the Letterman General Hospital, where the Commanding Officer, Lieutenant Colonel E. G. Northington, and his staff, demonstrated cases of interest to civil surgeons. After the meeting a supper and smoker were held.

1. Principles of treatment of shoulder joint after injuries and wounds; case demonstrations. Lieut.-Col. W. I. Baldwin.
2. Plastic amputations; case demonstrations. Major Leo Eloesser.
3. Bone grafts for the restoration of defects in bone; case demonstrations. Captain Sylvan Haas.
4. Weak and painful feet; case demonstrations and corrective appliances. Lieutenant T. J. Nolan.
5. Congenital absence of radius and thumb. Captain F. P. Topping.
6. War and the psychoses. Captain G. E. Meyers.
7. Arterio venous aneurism of arm; case demonstrations. Captain F. N. Chessman.
8. Operative treatment of peripheral nerve injuries; case demonstrations. Lieutenant Colonel H. C. Naffziger.

Tuesday, May 27th—Section on Eye, Ear, Nose and Throat.

1. Presentation of cases. (a) Angioma of middle ear. W. B. Stephens. (b) Sarcoma of naso-pharynx. Henry Horn.
2. Use of homatropine in refraction. Percy Sumner.
3. Some unusual cases of glaucoma. Hans Barkan.
4. Some experiences in the Army. H. A. Fletcher.

SAN DIEGO COUNTY.

The Southern California Medical Society recently held in Riverside was liberally attended by San Diego doctors, who reported a profitable and enjoyable time.

The League for the Conservation of Public Health seems to be steadily gaining members and support throughout San Diego County.

The dinner meeting of the County Society held at the San Diego Hotel May 13 was entertained by a delightfully informal talk on medicinal observations in France by Robert Preble, Lieut. Col. M. C., U. S. A., of Chicago. Dr. Preble speaks from the viewpoint of the internist, with a freedom and vividness of sketching that makes for real entertainment.

The second meeting of the Society in May was featured by informal talks by Drs. T. O. Burger, A. E. Banks and E. A. Frauer, all of whom have recently returned from France.

The next meeting will be devoted to reminiscences of medical practice in the early days of organized medicine in San Diego county, the honor guests of the evening being all men who have practiced therein in the past quarter of a century.

The second meeting in June will take the form of a dinner and dance at the Point Loma Country Club, to which all members are expected to bring their ladies.

Dr. J. F. Grant has received his honorable discharge from service at Rockwell Field and resumes his practice as oculist with offices in the American building.

Dr. John C. E. Nielsen is taking a course at the Trudeau School of Tuberculosis at Saranac Lake, N. Y.

The Society has adopted the policy of discontinuing meetings for a summer vacation during the months of July and August.

SANTA BARBARA COUNTY.

On May 30 at the call of Dr. Samuel Robinson a few interested physicians met at Dr. Robinson's home where a Journal Club was formed, the officers of which are as follows:

President, Samuel Robinson, M. D.; Secretary, C. S. Stevens, M. D.; Librarian, R. W. Hartwell, M. D.; Censors, Rexwald Brown, M. D., R. Manning Clarke, M. D., C. S. Stevens, M. D.

The Club will meet on the first and third Tuesdays of each month.

TULARE COUNTY.

The regular monthly meeting of the Tulare County Medical Society was held at Hotel Johnson, Visalia, June 1. About twenty-five members were present to enjoy the dinner and welcome back a number of their members who have been away on Government service.

Dr. W. W. Richardson of Los Angeles presented the principal paper of the evening on, "The treatment of some fractures by mobilization and massage."

The Kings-Tulare counties joint tubercular sanitarium was opened at Springville June 6 with a basket picnic to which the public were invited. Mrs. E. M. Tate-Thompson representing the State Board of Health was present and made an address. A number of talks followed by those interested in the different aspects of the work.

Notice

SOCIETY MEETING.

The Pacific Coast Oto-Ophthalmological Society will hold its annual meeting in San Francisco, August, 4, 5 and 6. Many important papers are promised for the program. Address all correspondence to the Secretary, Dr. A. S. Green, Shreve Building, San Francisco, Cal.

Red Cross Snap Shots

The following facts will show the rapid and tremendous growth of the Red Cross in its expansion from a domestic relief organization to a world-wide war relief agency:

The first enrollment in December, 1917, brought the Red Cross membership to 22,000,000.

The second fund drive during the week of May 20 to 27, 1918, was oversubscribed by millions above the hundred million asked for. Contributions to the second war fund drive totaled $180,623.106, more than 88 per cent. of which has been collected.

At the end of the fiscal year, June 30, 1918, 8,512 persons were employed in an administrative capacity at National, Divisional and Foreign headquarters of the Red Cross. More than 8,000,000 volunteers served in the 700 canteens.

Forty thousand persons were engaged in Red Cross Home Service Work, and the amount expended for relief each month ranged from $177,000 to $315,000.

By the end of the fiscal year the Red Cross, being a recruiting agency for the Army and Navy Nurses Corps, had enrolled 20,530 nurses.

An idea of the extent of the work undertaken by the Red Cross mission to Greece may be gained from the fact that on one day 126 carloads of refugees, containing 7,150 persons, were provided with 12,500 rations. On another occasion, at Tynovo-Siemen, 1,500 refugees were given rations, the sick

given emergency attention, 385 were clothed, 1,637 garments were distributed, 5 refugees were buried, and the train started for Dedeagatch, all within five hours.

Department of Pharmacy and Chemistry

Edited by FELIX LENGFELD, Ph. D.

Help the propaganda for reform by prescribing official preparations. The committees of the U. S. P. and N. F. are chosen from the very best therapeutists, pharmacologists, pharmacognosists and pharmacists. The formulae are carefully worked out and the products tested in scientifically equipped laboratories under the very best conditions. Is it not plausible to assume that these preparations are, at least, as good as those evolved with far inferior facilities by the mercenary nostrum maker who claims all the law will allow?

Every physician must re-register under the Harrison Anti-Narcotic Act for the period of one year from July 1, 1919, to June 30, 1920. The law requires him to register before the first of July but in past years the Internal Revenue Department has allowed thirty days grace before imposing a penalty. Every physician should attend to this at once, if he has not already done so.

Every physician has undoubtedly received from the Department a blank application form, a blank inventory slip and full directions regarding the whole matter. He should read these directions carefully and follow them exactly.

Unfortunately, many physicians seem to regard the men who are charged with the enforcement of this law as their personal enemies and do everything they can to hamper the work. As a matter of fact the deputies are an overworked patient lot of men who must follow the instructions they receive from Washington and have no discretion in the matter. They have always shown themselves willing to co-operate with the physician and have many times closed their eyes to violations of the law when they were convinced that this was due to ignorance or even carelessness and was not willful. Every physician knows that this law is necessary, even if it does, at times, work hardship and discomfort. He should bear in mind that this cannot be avoided and that the deputy will do all he can to make things as easy as possible for him.

The Council on Chemistry and Pharmacy has refused to admit two new and non-official remedies, some of the "colosols" or colloidal solutions offered for sale to the medical profession. Probably some colloids in colloidal solution are more readily absorbed by the colloids of the body than are the same substances in suspension or in true solution and some colloidal solutions are perhaps less poisonous and have greater therapeutic value than the same substances otherwise administered. However, the physician should bear in mind that we know very little regarding the true nature of colloidal solutions notwithstanding the great advance in the theory of true solutions and the work done with the ultra microscope.

Neither the chemist nor the physician can predict just how colloidal solution will act, much less the physiologist or pharmacologist whose problem is so much more complicated. The advertising man and the detail man have an excellent line of scientific patter which dazzles the physician, and which may be entirely false or may have no bearing on the subject in hand. Much laboratory and clinical work are necessary on every new colloidal solution before it can be accepted as a valuable therapeutic agent with any degree of confidence.

"Colosol" cocaine, (Colloidal Sol) claims to contain 1% of cocaine and to be much less poisonous than ordinary cocaine but to have the same therapeutic effect. Laboratory and clinical work showed it to be less poisonous than a 1% Sol of cocaine, but a chemical analysis showed it to contain only .26 to .40% cocaine instead of 1% as advertised and to be just as poisonous and no more efficacious than the solution of cocaine of this percentage.

Colosol Manganese was found by a British Commission to have no effect on Malaria in the doses recommended.

Colosol Copper or Cuprase, has been advertised for cancer but seems to have no effect on that disease.

About fifty years ago Colloidal Iron or dialized iron, claimed to have all of the good and none of the bad properties of ordinary iron salts, but time and experience have not justified these claims.

There seems to be a peculiar fascination to Iodine that leads the manufacturers of nostrums to present it to the medical profession with all kinds of extraordinary claims. It is difficult to see any reason for this as there are enough official preparations of iodine to satisfy every use to which this drug may be put. We need only mention, iodides of potassium, sodium, ammonium, strontium, etc., tincture of iodine which is miscible with water in all proportions, syrup of hydriotic acid, syrup of iodide of iron, iodine ointment, etc. Campeteodin is one of the latest of the proprietary iodine preparations. It claims to contain iodine in an oleaginous solution, two strengths No. 1 and No. 2, the latter being twice as strong as the former. An examination proved that the iodine was practically all combined with the oleaginous solvent and that No. 2 does not contain twice as much iodine as No. 1.

Iodex is another of these preparations claimed to have all the good and none of the bad qualities of elementary iodine. Iodex, according to the advertisements, contains 5% of iodine "therapeutically free, an embodiment of vaporized iodine in an organic base." This may be all right but it is difficult to understand just what it means and it is needless to say that the Council has not admitted it to the N. & F.

Carminzyn Tablets claim to be a mixture of pancreas extract, calcium carbonate, soda bicarbonate and Epicac with carminatives. It was rejected by the Council as irrational and tending to lead to slipshod prescription.

Peptinzym Tablets were found to have no effect on fats or carbohydrates in the test tube. The claim made by the manufacturers that, though inert in the test tube it does good work in the body, is one that cannot be proved or disproved but seems to have no justification.

Vercolate Tablets were found in 1915 to be unscientific in composition and exploited under false claims.

Many physicians have received circulars concerning the bacteriological properties of Tyres Powder. The work seems convincing but the physician should bear in mind that these tests were made in 1889 on a powder which was entirely different from the powder on the market today, and draw his own conclusions.

VOCATIONAL STUDY OF TUBERCULOSIS.

A vocational study of tuberculosis is being made for the purpose of obtaining information of the various experiments that have been tried in institutions in the country that have been at all successful in employing arrested cases of tuberculosis. "Fortunately," said Mrs. E. L. M. Tate Thompson, Director of the Bureau of Tuberculosis, "this State can offer two splendid examples of work of patients. Arequipa Sanatorium, in Marin county, for working girls, maintains an open air pottery. The girls are paid for their work, and at present are filling an order for decorative tile. The Barlow Sanatorium, outside of Los Angeles, is another semi-philanthropic sanatorium, whose patients work as part of their cure when they are well enough. A great deal of practical work, such as gardening and building of walks, is being done."

"The public must be prepared to accept these patients back into industrial life," continued Mrs. Thompson. "There is no doubt but that last year there were very many men discharged with tuberculosis; and it was most discouraging attempting to place them in positions they had held formerly."

"The man who is cured of tuberculosis has learned his lesson and, from a public health standpoint, is an asset to a community. Compare him with the man who wants his windows closed, who is careless in his habits, and the problem of vocational study simplifies itself."

In an address, delivered before the recent New Jersey Joint Conference on Tuberculosis, Krause, of the Johns Hopkins Medical School, attempts a review of the anti-tuberculosis movement and indicates how our measures of prevention and control should be supplemented and enlarged so as to square with the shifting point of view that the newer knowledge of the disease of the last ten years has brought us.

Not all the diminution in the tuberculosis mortality rate may be ascribed to our intentional efforts. Much is undoubtedly due to the broad social and economic movements that have brought about better living conditions. Since the application of the Pirquet test we have learned that tuberculous infection is practically universal. It is therefore at least questionable whether efforts at prevention and control should be too largely concentrated on the prevention of infection. Infection, of itself, is of comparatively minor importance. It is the development of infection into clinical disease, into manifest tuberculosis—that we are really concerned with and should make every effort to prevent.

Krause pleads for a better appreciation of this phase of the situation and asks for renewed effort for the expenditure of money without let-up, for what amounts to the unremitting and universal education of physicians and laymen in the truths of tuberculosis, and for a broadening and intensification of the work of the National Tuberculosis Association. He concludes:

"Nor is there room in the anti-tuberculosis movement for a single note of discouragement. The pessimists among us can be only those who are deficient in grasp and breadth. Civilization and tuberculosis are contemporaneous; the number of the tuberculous and the number of civilized beings are almost coequal; therefore, to despair of tuberculosis is to despair of civilization. A graft that is as much a part of us as is the development of our ethical sense cannot be lopped off in a day; but it can be kept from flowering and bearing fruit. And until we can wage direct warfare on the germ, to keep it in the seed should be our main purpose."

Krause, Allen K., Anti-tuberculosis Measures, American Review of Tuberculosis, 1918, Vol. 2, No. 10.

New Members

Fletcher, Harold A., San Francisco.
Wood, Neal N., Los Angeles.
Magan, Wellesley P., Covina.
Thurber, Packard, Los Angeles.
Murray, J. T., Los Angeles.
Waters, O., Long Beach.
May, H. Cameron, Los Angeles.

Deaths

Dalton, John C., a graduate of the Starling Medical College, Ohio, 1874. Licensed in California, 1901. Died in Pasadena, Cal., May 19, 1919.

Freeman, Gideon M., a graduate of Physicians and Surgeons, Baltimore, Md., 1870. Died near San Jose, Cal., June 10, 1919.

Smith, H. W., a graduate of Rush Medical College, 1870. Licensed in California, 1880. Died in Folsom City, Cal., at the home of his daughter, Dr. L. Etta Farmer.

A PRESCRIPTION

How to Kill a County Society

1. Don't come.
2. If you do come, come late.
3. If too wet or too dry, too hot or too cold, don't think of coming.
4. Kick if you are not appointed on a committee, and if you are appointed, never attend a meeting.
5. Don't have anything to say when you are called upon.
6. If you attend a meeting, find fault with the proceedings and work done by other members.
7. Hold back your dues, or don't pay them at all.
8. Never bring a friend whom you think might join the society.
9. Don't do anything more than you can possibly help to further the society's interests; then, when a few take off their coats and do things, howl, "This society is run by a clique."

GENERAL LIBRARY
SEP 10 1919
UNIV. OF MICH.

Medical Lib.

California State Journal of Medicine

ISSUED MONTHLY: OWNED AND PUBLISHED BY THE

MEDICAL SOCIETY OF THE STATE OF CALIFORNIA

Vol. XVII, No. 9 SEPTEMBER, 1919 $1.00 a Year

CONTENTS.

Editorials 311
Original Articles: Technique for the Removal of Dead Teeth. By Josef Novitzky, D. D. S..... 314
The Specialty of Obstetrics; Its Present Status. By H. P. Newman, M. D..... 318
Pregnancy After Uterine Suspension. By L. A. Emge, M. D..... 320
Infections of the Oral Cavity and Their Relation to Systemic Diseases. By H. C. Bagby, M. D..... 323
The Epidemic of Filaria-Onchocerca. By Wm. Thos. Fee, Consul, Guatemala..... 327
Increased Spinal Fluid Pressure as an Indicator of Meningeal Disease. By H. G. Mehrtens, M. D..... 328
The Rapid Administration of Digitalis in Cardiac Decompensation. By Dr. W. E. Kay and Dr. J. M. Tufts.... 329
Nephrolithiasis: Report of a Rather Unusual Case. By W. B. Dakin, M. D..... 331
A Schematic Method for Estimating the Health Status of the Runabout Child. By C. E. Carter, M. D..... 333
Economical Aspects of State Hospital Discharges and Paroles. By M. J. Rowe, M. D. 337

(Contents continued on page IX.)

ENTERED AT SAN FRANCISCO, CAL. AS SECOND-CLASS MATTER

Out—New Mayo Clinic Volume

Tonsillar Infection and Recurrent Vomiting
Artificial Feeding of Infants
Esophageal Diverticula
Syphilis of Stomach
Radiologic Aspects of Hour-glass Stomach
Polyposis of Stomach
Cautery Excision of Gastric Ulcer
Treatment of Peptic Ulcer by Gastro-enterostomy
Etiology of Cholecystitis: Injection of Streptococci
Surgery of Gallbladder and Biliary Ducts
Liver and Its Cirrhoses
Secondary Tuberculous Peritonitis
Acute Perforations of Abdominal Viscera
Chronic Ulcerative Colitis
Carcinoma of Small Intestine
Fistula of Colon
Primary Retrograde Intussusception of Sigmoid, with Tumor
Ectopic or Pelvic Kidney
Radiographic Diagnosis in Renal Tuberculosis
Effect on Kidney of Uretero-vesical Anastomosis
Prostatic Calculi
Diverticula of Bladder
Thyroid Hormone and Its Relation to Other Ductless Glands
Cancer of Thyroid Gland
Principles of Thyroid Surgery
Splenectomy following Radium for Myelocytic Leukemia
Arborization Block
Congenital Dextrocardia
Studies on Cholesterol
Fragility of Erythrocytes
Moss Method of Determining Isohemagglutination Groups
Blood Transfusion
Clinical Studies in Cutaneous Aspects of Tuberculosis
Skin-grafting
Roentgenology of Syphilis
Atropin and Induced Anti-anaphylaxis as a Protection against Acute Arsphenamin Reactions
Etiology and Treatment of Epidemic Poliomyelitis
Celluloid in Correction of Nasal Deformities
Surgical Treatment of Epithelioma of Lower Lip
Heat and Radium in Cancer of Jaws and Cheeks
Radium in Neoplasms of Nose, Throat, and Mouth
Ankylosis of Jaw
Partially Autolyzed Pneumococci in Lobar Pneumonia
Treatment of Empyema
Fracture of Neck of Femur
Cystic and Fibrocystic Disease of Long Bones
Peroneal Tendon as Transplant
Derangements of Semilunar Cartilages of Knee-joint
Osteocartilaginous Joint Bodies
Nervous Symptoms in Pernicious Anemia
Surgical Treatment of Progressive Ulnar Paralysis
Sodium Bromid in Radiography
"Schreiber" Adapter for Intravenous Injections
Hypophyseal Tumors Through Intradural Approach
Kondoleon Operation for Elephantiasis
Recurring Inguinal Hernia
Treatment of Menorrhagia with Radium
Prophylactic Inoculation during Pandemic of Influenza
Study of Surgical Shock
Tuberculosis Associated with Malignant Neoplasia
Dakin's Solution in Normal Peritoneal Cavity
Cancer Problem
Tetanus and War
War Modifications of Some Civil Surgical Practices

By William J. Mayo, M. D., Charles H. Mayo, M. D., and their Associates at The Mayo Clinic, Rochester, Minn. Octavo of 1196 pages, illustrated. Cloth, $8.50 net.

W. B. SAUNDERS COMPANY Philadelphia and London

FRANK F. WEDEKIND--- TRUSSES, ELASTIC GOODS ABDOMINAL SUPPORTERS

(SEE PAGE XI)

Neoarsenobenzol "Sanar" (French Neosalvarsan)

0.15 Ampule - - - - - $1.00	0.45 Ampule - - - - - $2.00	0.75 Ampule - - - - - $3.00
0.30 Ampule - - - - - 1.50	0.60 Ampule - - - - - 2.50	0.90 Ampule - - - - - 3.50

May be given intravenously with a Lüer Syringe dissolved in 10 c. c. more or less, of sterile water. It requires no neutralization. We have dispensed thousands of tubes of NEOARSENOBENZOL "SANAR" and the product gives general satisfaction. It may be given intramuscularly but the intravenous method is preferred.

Huile Grise Injectable (Dr. L. Lafay, Paris)

¶ French Grey Oil—For intensive Mercurial treatment. One grain mercury as metal is exhibited in 2½ minims—six grains to the c.c. Given deep into the gluteus once weekly. In 5 c.c. vials at $2.50. Our special Lüer Grey Oil Syringe complete in metal box at $3.50.

Fred J. Lackenbach, Biologic Depot

BACTERIOLOGICAL, SEROLOGICAL AND CHEMICAL WORK

9th FLOOR BUTLER BUILDING **SAN FRANCISCO** 135 STOCKTON STREET

TELEPHONE SUTTER 3122

HELPS IN DIAGNOSING

Originated and Endorsed by Prominent Physicians
Practical and Convenient

RENAL FUNCTIONATION

Phenolsulphonephthalein

ACIDOSIS CONDITIONS

Apparatus for Determining:
CO_2 TENSION OF ALVEOLAR AIR
ALKALI RESERVE OF BLOOD
HYDROGEN-ION CONCENTRATION
OF BLOOD

UREA IN URINE AND IN BLOOD

Urease-Dunning

Literature Upon Request

HYNSON, WESTCOTT & DUNNING
Baltimore